

MARINE REVIEW.

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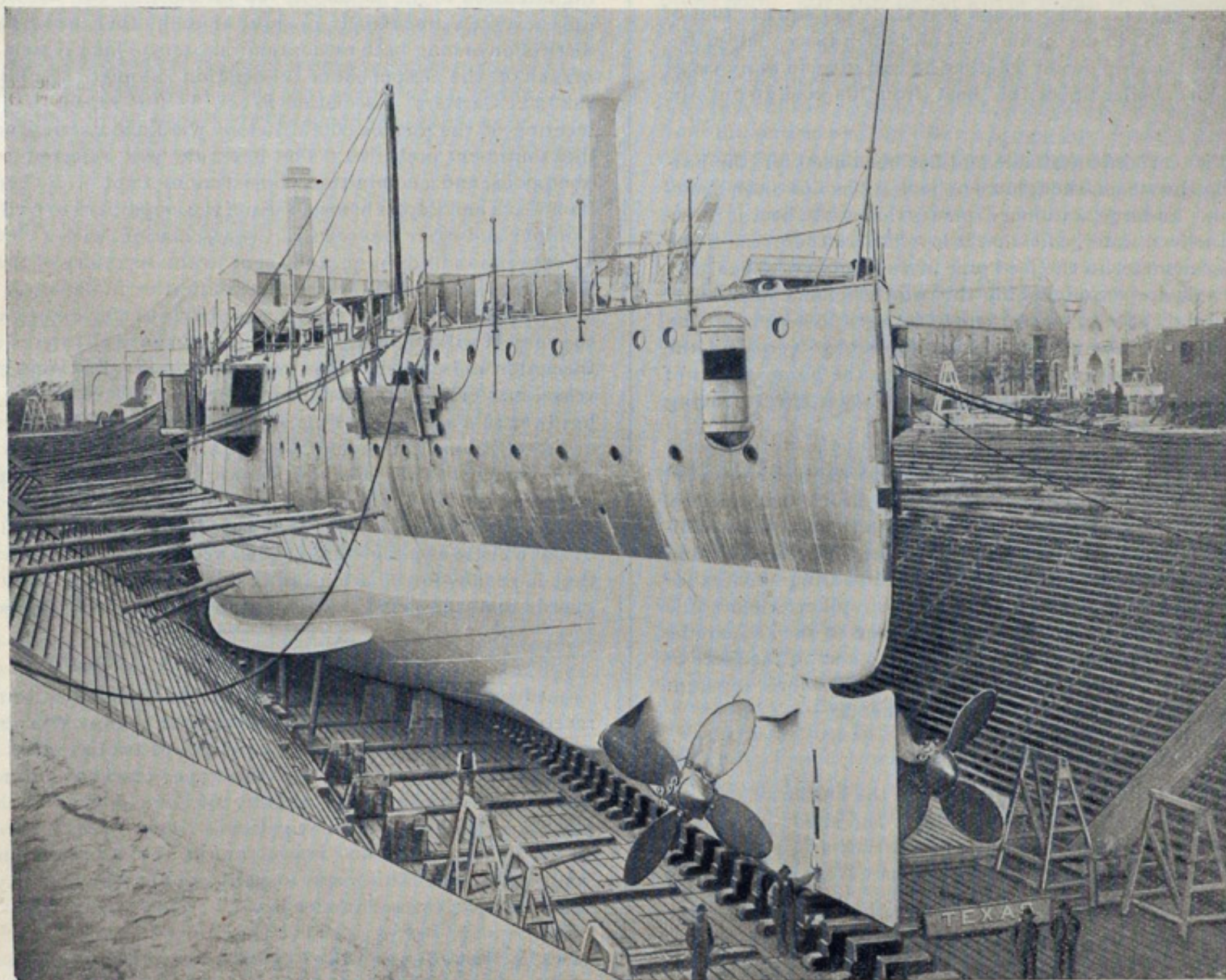
Our Supplement—The Steel Steamer W. H. Gratwick.

The supplement of the steel steamer W. H. Gratwick, presented with this issue, is a product of photography in colors, and we have called it a color etching. It is certainly an elegant specimen of fine printing and the most attractive supplement ever published with a marine paper. The system of producing a picture of this kind from impressions made by different plates and different colors was discovered only recently, and the illustration of the Gratwick is the first marine scene produced by the process. It is much finer than lithography, presenting tints and shades impossible to that art, and it is true to the original, a quality that can not be claimed for any other process. The MARINE REVIEW originated the idea of supplements representing marine scenes, and it is intended to at all times take advantage, as in this case, of the very best methods in the art of printing. We have others in reserve, some of them according to other processes but also very attractive.

The boat, of which Capt. John Mitchell of the firm of Mitchell & Co.,

modern appliance in the way of deck winches, hoisting engines, etc., and has steam windlass and steam capstan of the American Ship Windlass Co.'s make, with a steam steering engine, also, furnished by Williamson Brothers of Philadelphia. She is heated by steam and lighted by electricity throughout. The lighting plant includes large cargo lights. Her cabins are among the very finest to be found in boats of her class.

The motive power consists of triple expansion engines, with cylinders 20, 32½ and 55 inches by 42 inches stroke, driving a Trout sectional wheel 12 feet 10 inches diameter and 16 feet pitch. Condenser and all pumps are independent of the main engine. They were furnished by Dean Brothers of Indianapolis. Steam is supplied by two cylindrical return-tubular boilers; 13 feet diameter and 12 feet long, at a pressure of 164 pounds per square inch. The boilers were made by Wickes Brothers of Saginaw, E. S., Mich. The General Electric Company of Chicago furnished the lighting plant, which is driven by a Ball engine, manufactured by the Ball Engine Company of Erie, Pa.



U. S. S. TEXAS IN DRY DOCK.

Cleveland, O., is managing owner, is one of the finest steel steamers on the lakes. She was built by F. W. Wheeler & Co. of West Bay City and is engaged in the package freight business between Duluth and Buffalo.

The principal dimensions of the Gratwick are: Length over all, 345 feet; length of keel, 328 feet; beam, moulded, 42 feet 6 inches; beam, extreme, 42 feet 8 inches; depth, moulded, 24 feet; depth of hold, 20 feet 8 inches; height between decks, 8 feet 3 inches; height, forecastle, 6 feet 9 inches.

The material used in the construction of this vessel is tested to stand a tensile strength of 60,000 pounds per square inch, with an elongation of 25 per cent. in 8 inches, and is of the best open hearth quality, and the construction of the vessel throughout is such as to give her the highest rating obtainable in the United States Standard Register of Shipping. She has a double water bottom 42 inches deep, extending fore and aft, with a capacity of 1,000 tons of water ballast. She is fitted with every

United States Battleship Texas.

An engraving showing one of the new first rate vessels of the United States navy, the battleship Texas, in dock is presented on this page. The Texas was built by the navy department at Norfolk, Va., and is 6,300 tons displacement. She is 290 feet between perpendiculars, 64 feet 1 inch extreme breadth and 22 feet 6 inches mean draft. Work on her was begun in 1888 and practically finished with the close of 1893. Her engines are twin screw triple expansion, the combined indicated horse power being about 8,000. She has a coal capacity of 850 tons and her speed is about 16 knots.

About May 1 the Bath Iron Works of Bath, Me., will launch a steel auxiliary yacht 235 feet long and of 1,500 tons. She will have triple expansion engines but will be full bark rigged, and will use her sails most of the time. The propeller is so arranged that it can be readily unshipped.

Notes and Queries on Engineering Subjects.

CONDUCTED BY GEO. C. SHEPARD.

MR GEO. C. SHEPARD.—Will you kindly tell me through the columns of the MARINE REVIEW the effective area of a cone-shaped piston, 32 inches in diameter and 10 inches from top edge of side to bottom of nut on the rod? The flat place is about 8 inches diameter

Chicago, April 15, 1894.

L.

The effective area is that of a diameter of 32 inches or 804.24 square inches. The fact that it is cone-shaped adds nothing to its working area, and it is made so only for the purpose of getting strength with lightness.

Editors MARINE REVIEW.—Can you tell me what the temperature is in the stacks of some of the larger lake steamers, and how much of it is waste heat?

Cleveland, O., April 11, 1894.

M.

The writer has found the temperature of steamboat stacks to vary from 800° to 1,200°, but since the quantity of gases passing through the stacks was not to be obtained, it is impossible to say what per cent. of loss this represents, any more than to say that the temperature is excessive, 600° being sufficient to create draft, and the difference between this and actual temperature is heat thrown away. To obtain more of the heat of the furnace it would be necessary to make the tubes of the boilers longer, increasing the heating surface and abstracting more of the heat, but to abstract a unit of heat from gases at 800° requires more heating surface than to get the same from gases at 2,800°, so that to make this lost heat available the boiler must be enlarged very considerably without a proportionate increase of capacity. This means less H. P. per square foot of heating surface and less H. P. per cubic foot of boiler space, and it becomes a question with the ship owner whether he will give up more cargo space and pay for more boiler or see the heat from his coal go out the stack.

This waste heat is certainly available and has been used for the purpose of superheating the steam, though we believe it has not been a success in this direction. In large stationary plants this waste heat is, however, used to heat the feed water, and that it is effective there can be no doubt, since the thermometer in the feed pipe often registers above 300°. What an advantage a device accomplishing this would be on a steamboat? The engineer would not have to compromise between low vacuum and cold feed water but could take all the vacuum possible, increasing the mean effective pressure on the L. P. piston and hence the horse power of his engine, and at the same time by heating his feed water effect a saving of 1 per cent. for every 10° increase in its temperature.

If the water tube type of boiler with its apparent advantages is adopted in general practice, the problem of mechanical stoking for marine boilers becomes an easy one, for while the design of the Scotch boiler is prohibitive for this feature, the water tube boiler generally permits of the adaption of stokers thereto, and with the stoker comes coal handling devices for moving the coal from the bunker to the hopper of the stoker, whence it is fed onto the fire without manual assistance. By means of such apparatus actual saving in coal will result as well as materially reducing the force of firemen and coal passers. The larger the steam plant the more apparent will be the advantage from the use of such arrangements.

Notices to Mariners.

The wreck of a vessel lies in 18 feet of water in the harbor of Presque Isle, Mich., one-half mile east of the range lights and about 300 feet to the northward of the range line. Portions of the wreck are within 7 feet of the surface. A buoy will be placed to mark the spot as soon as possible.

On the opening of navigation, the front light of the range on Wisconsin point, Superior bay, is to be moved a few feet to the westward, so that the range line will pass nearer to the axis of the channel and further from the old light-house dock than heretofore. This range will lead well past the old dock and vessels should then head up so as to pass more to the northward of Quebec channel light.

On or about April 20, Niagara river range (front) light, on the east bank of the river near its head, will be moved to a new structure erected on the berm bank of the Erie canal 71 feet south of the present location of the light. The light will be exhibited at an elevation of 54½ feet above lake level. The new range line is intended to mark the channel of deepest water where it has been improved below the channel which is marked by Horseshoe reef light-house.

All England Talking Tubulous Boilers.

The technical journals of England devoted to the ship building industry are giving up many pages of space these days to the tubulous boilers. At the recent meeting of the Institute of Naval Architects one entire session was given up to the discussion of papers relating to this type of steam generator and great interest was shown in the proceedings. The verdict was that the boiler has come to stay, and that with its elevation

into favor for marine purposes the decadence and almost complete extinction of the Scotch boiler is only a matter of time. W. H. White, director of naval construction said that the admiralty authorities had not decided to adopt tubulous boilers for several of the new vessels of war without due consideration, and had sent out an engineer to Australia to make passage in the vessels fitted with water tube boilers, in order that they might obtain full information of their working. Two years ago, when the speaker was in France, he was impressed by the fact that there was not then building for the French navy any vessel what ever, from the largest ironclad to the smallest torpedo boat, which had not a water tube boiler. The admiralty, after the facts reported to them in regard to the Australian boats, and from the experience gained by the Speedy and other vessels had determined to fit the most tried types of water tube boilers."

The discussion developed the fact also that the interests arrayed against the innovation of the tubulous boiler are numerous and strong. The interests of the machine tool makers and of the boilermakers are seriously menaced, inasmuch as the heavy and special class of machine tools requisite in dealing with the shells of cylindrical boilers will, under the reign of the tubulous type, find their occupation gone. The interests of manufacturing firms such as those who produce by special methods the present type of boiler furnaces are likewise menaced, as are those of inventors of forced draught systems and apparatus.

Passing Signals in Fog.

As has been expected, the article in THE REVIEW of last week directing attention to the steamboat law prohibiting the use of passing signals unless vessels are actually in sight of each other, has created considerable discussion among both owners and masters of lake vessels. The Cleveland branch of the Shipmasters' Association adopted resolutions requesting the Lake Carriers' Association to ask for the repeal of the law, and at a meeting of the finance committee of the Lake Carriers on Tuesday last a like sentiment prevailed. The new rule was referred to as absurd and obnoxious, and a committee, consisting of Capt. C. E. Benham, Capt. William Mack and Capt. Thomas Wilson, was appointed to confer with Attorney Goulder and other interests in the association, with a view to formulating an expression of opinion to be sent to the secretary of the treasury and to Gen. Dumont. As the legislative committee in Buffalo is somewhat favorably inclined toward the rule, it is probable that an expression of opinion on the subject will not be sent to Washington until all interests are agreed as to the action to be taken. It is certain, however, that the great majority of vessel masters declare that even when running only fast enough to keep headway in a sea the passing signals are absolutely necessary in order to avoid collision. There is of course the danger of the porting signal being confounded with the one blast blown by steamers in a fog, but the greatest source of complaint from the captains is that instead of the inspectors assisting, as proposed some time ago, in the establishment of three blasts of the whistle as a fog signal for all vessels, whether having tows or not, they have now forced attention to a law that takes away the only safeguards that were left if vessels are to run at all in thick weather.

Outlook at Port Arthur.

Advices from Macdonell & Co., vessel agents, Port Arthur, Ont., received by the REVIEW on Thursday, are: "Capt. Wm Craig, light keeper at Thunder Cape, reports the ice solid for twelve miles outside of Port Arthur. It is all gone around the cape, cracked and rotten for about three miles inside to the vicinity of Hare island. Unless the weather proves very unfavorable, navigation is likely to open here between May 1 and 5. The ice has not moved out of the Kaministiquie river at Fort William as yet. This event usually occurs from ten days to two weeks before the ice leaves Thunder bay."

A method of using the number of revolutions of the screw propeller of a vessel to serve as a log in a speed trial is that of standardizing the screws by runs over the measured mile immediately before and immediately after the trials. The number of revolutions corresponding to the various speeds is thus determined. This method of determining the speed is particularly accurate if the depth of water over the measured mile course is sufficient to avoid drag and excessive wave making at the higher speeds. This method has the effect of underlogging rather than overlogging a ship, and is consequently not much in favor with those nations or builders who desire to impress their neighbors by high apparent, but really fictitious, speeds determined by patent logs.—Exchange.

The upper Portage lake ship canal will have fifteen feet of water at the opening of navigation. Heavily loaded vessels are warned to keep slightly to the west of the center of the canal. The canal is now in better condition than it has ever been since its construction.

The supplement in this issue of the REVIEW is a product of photography in colors. Send 20 cents in stamps to the MARINE REVIEW, Cleveland, O., and you will receive a copy in a tube.

Unfair Distribution of Appropriations.

Of late the REVIEW has directed attention to the enormous appropriations that are constantly being made by congress for river and harbor improvements in the Mississippi valley, mainly under the Missouri and Mississippi river commissions. The table printed herewith will show how largely these appropriations have been out of proportion with the vessel tonnage owned on the rivers, as compared with the Atlantic coast and the lakes, especially the latter. The figures in these tables as regards appropriations are from census reports prepared from the records of army engineers, while the statistics as to the number and tonnage of vessels owned in the different districts are from the 1893 report of the United States commissioner of navigation. It may appear somewhat imprudent to encourage sectional strife in the matter of river and harbor improvements, but the enormity of appropriations for the Mississippi of late against the lakes and northern seaboard is beyond all that is reasonable.

Up to 1890, the Mississippi valley, which has only 6 per cent. of the vessel tonnage of the country, had been accorded 37 per cent. of appropriations, against 20 per cent. of appropriations for the lakes where 26 per cent. of the tonnage of the country is owned. In glancing over the table, which shows in detail the injustice of this unequal distribution of funds, it must be noted also that a very large part of the seventy-eight millions of dollars credited to the Atlantic and gulf coasts was expended at the mouth of the Mississippi. It may be claimed that in the statistics as to tonnage no account is taken of the great number of unregistered flat barges in use on the rivers, but no figures are needed to show that the difference in the total freight business of the rivers and lakes is not sufficient to cause such a wide margin as that shown in appropriations. Following is the table, which is taken from the best available sources of information.

STATEMENT SHOWING RIVER AND HARBOR APPROPRIATIONS FROM EARLIEST DATE OF APPROPRIATIONS TO 1890, AND ALSO VESSEL TONNAGE OWNED IN DISTRICTS FOR WHICH APPROPRIATIONS WERE MADE

| LOCALITY. | Appropriation. | Number of vessels. | Tonnage. | Per cent. of total tonnage. | Per cent. of appropriations. |
|-----------------------------------|----------------|--------------------|-----------|-----------------------------|------------------------------|
| Great Lakes..... | \$ 42,036,327 | 3,761 | 1,261,068 | 26 | 20 |
| Atlantic and Gulf coasts..... | 78,180,915 | 17,913 | 2,807,689 | 58 | 38 |
| Mississippi river and tributaries | 76,827,463 | 1,289 | 298,892 | 6 | 37 |
| Pacific coast..... | 9,999,165 | 1,549 | 457,422 | 10 | 5 |
| | \$207,043,870 | 24,512 | 4,825,071 | 100 | 100 |

Notwithstanding the injustice in the distribution of government funds for the aid of shipping, little is being done in Washington to increase lake items in the appropriation bills now nearing final consideration by congress.

Low Rate Ore Contracts—Lake Freights.

About 75,000 tons of Marquette ore, on which contracts will expire Sept. 1 to 15, has been covered by two shippers within the past few days at 65 cents lake freight. Among the vessels engaged in the contracts are the steamer Owen and consorts Michigan and Nicholson, steamer Ira Owen and the Hackett and consort. The steamer Gogebic and the new barge which she will tow have been placed on a contract that practically covers the entire season for ore from Duluth at 80 cents, and as these boats were taken by M. A. Hanna & Co., it is probable that that firm has sold enough of the ore of the Iron Mountain and Franklin mines (Missabe range) to provide cargoes for the six boats of the Menominee Transportation Company, which they control, for the greater part, if not all of the season, from Duluth. In all cases this ore is taken, as has been the case in all previous contracts, without any definite assurance as to coal cargoes for return trips. The general situation is not improved, and these transactions in ore at extremely low prices are looked upon by most owners as very dangerous contracts for the vessels. Still, many owners are found ready to take the chance involved, and one shipper, who will have considerable coal to move to the Portage lake district and probably some ore to come down from Marquette, is offered boats at 35 cents for the coal and 65 cents for the ore.

With labor troubles at terminal points in all parts of the lakes, and a certainty, almost, of a general strike among soft coal miners on Monday next, there is every reason to look for the lake fleet being restricted to less than 50 per cent. of its capacity in active times for several weeks to come. There are no wild cargoes offered from any of the ore ports, the grain trade is practically at a stand-still, and although vessels having ore contracts might be found to take single loads of soft coal at 20 or even 15 cents there is no coal offered to them at any price.

Someone has figured that the Minnesota Iron Company has about 600,000 tons of ore in stock and has sold altogether for 1894 1,200,000 tons, of which 300,000 tons is to come from its two Missabe mines, 500,000 tons

from the Chandler and 400,000 tons from the Minnesota mine proper. These figures may be wide of the facts and, of course, the Minnesota company is not giving out statements as to its sales, but they are certainly very heavy, as aside from their own boats, which may be expected to carry at least 600,000 tons, they have engaged tonnage from Harvey H. Brown, the Republic and Cleveland-Cliffs mining companies and Mitchell & Co., vessel brokers.

Naval Engineers to Examine the Northwest.

Chief Engineer Melville of the United States navy will, with the permission of the builders and owners of the Northern Line passenger steamer Northwest, detail two officers from the naval engineer corps to make an examination of the ship with special reference to engines and boilers. The officers will probably arrive in Cleveland about May 1, when the boat will be in readiness to go to Buffalo. It is very probable that Mr. Melville's prime object is to secure data relative to the working of the Belleville tubulous generators, but the quadruple expansion engines also represent the latest practice in marine engineering, and authentic information regarding the new ships of this line will be valuable in the department anyhow, as the practicability of fitting them at some time, in case of emergency, for war purposes on the lakes may demand consideration from the government. If the results of tests made by these naval officers are given out, the information will be very valuable, on account of the disinterested source from which it would come.

Capt. Campau of the Northwest has been at work in Cleveland for several days past arranging details regarding his crew and the management of the ship. His chief officer will be Frank D. Welcome, the second officer John Tyrney and the third officer R. McDermott. The four quartermasters, or wheelsmen as they are called on the ordinary lake vessel, will also be licensed pilots. The entire ship will, of course, be under the direction of the captain, but on account of the assistance he will have from the several leading officers under him, little of his time will be taken up with the management of detail regarding the crew. Discipline and cleanliness of the ship, for instance, will be entrusted to the chief officer, who will have nothing to do with sailing the vessel.

Both of the quadruple engines of the ship have been turned over separately several times during the past week, with the boat tied to the dock in the ship yard, and there is no fear of any want of steam from the boilers. With steam on only five boilers of the twenty-eight in the boat, the number of revolutions on one engine was better than sixty.

Mr. C. H. Cramp on the Fithian Bill.

Charles H. Cramp, the Philadelphia ship builder, says that for the passage of the Fithian bill, which proposes to admit foreign vessels to American register if they are to engage only in the foreign trade, the English government, aside from its ship builders, could afford to pay \$100,000,000, in view of the diplomatic advantage which a ready asylum for its merchant marine under our flag would give them in dealing with other naval powers. "England is principally afraid of France and Russia, particularly the latter," says Mr. Cramp. "I wish I was at liberty to repeat some conversations I have had with eminent Russian and French naval officers on this subject. England's weak spot in war is her merchant marine; that is the heel of her Achilles. Her inability to transfer it to a neutral flag is a bond to keep the peace in an untold sense. England's navy is not strong enough to take care of her merchant fleet. Remember the Alabama. War between England and France or Russia would turn fifty Alabamas loose on the ocean. For every one that the fast British cruisers could catch or destroy, two would come out. Insurance rates would bankrupt owners of vessels and cargoes. In a word, the English dare not fight a naval power without a neutral asylum for their merchant fleet."

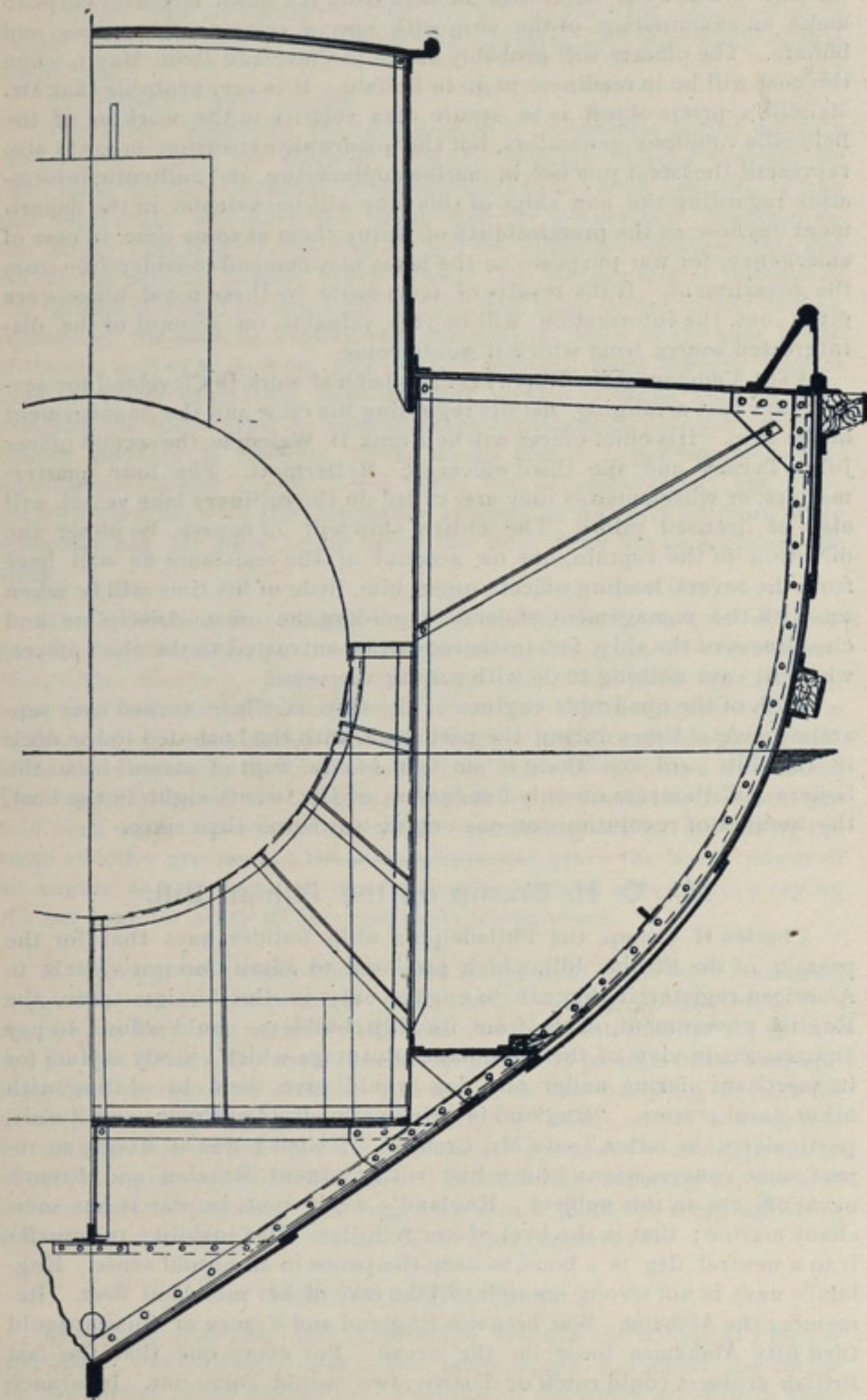
Regarding the direct effect of the passage of the bill in this country Mr. Cramp says: "Our works employ 6,000 men directly, and furnish employment for twice that number in the mills, forges and foundries that make our material. I have estimated that our ship yard and its accessories feed, clothe and provide homes for 75,000 men, women and children, and I have no hesitancy in saying that the passage of the Fithian bill would absolutely and almost instantly deprive these people of their present means of livelihood. Our works would undoubtedly be seriously crippled, if not compelled to shut down, as soon as the construction now in hand was completed. There would be no alternative unless our men would agree to work for about half of their present wages."

SEND 20 CENTS IN STAMPS AND HAVE A COPY OF THE COLOR ETCHING OF THE STEEL STEAMER GRATWICK MAILED TO YOUR ADDRESS OR TO THE ADDRESS OF SOME FRIEND WHOM YOU WISH TO PLEASE. MARINE REVIEW, 516 PERRY-PAYNE BUILDING, CLEVELAND, O.

The through sleeping car to California is now running regularly. Talk to agents of the Nickel Plate road about it. Apl 30

Steel Harbor Tugs.

Steel harbor tugs are new to the lakes, and readers of the REVIEW will accordingly be interested in the accompanying cross-sectional plan of the largest of the three boats being built by the Globe Iron Works Company for L. P. & J. A. Smith of Cleveland. These tugs are to be distinctively steel boats, as even the sleeping bunks and slides for doors and windows will be of metal. The first and largest of them, No. 54, will be launched probably on Saturday of this week. She is 80 feet over all, 18 feet beam and 12 feet depth and will have a high pressure engine, 18 by 20 inches to make 170 revolutions at 150 pounds steam pressure. The propeller will be 7 feet diameter and 10 feet lead. The vessel's mean draft



will be $7\frac{1}{2}$ feet—5 feet forward and 10 feet aft. The main deck, water tight, is 24 feet long forward and 13 feet aft.

Some detail regarding material entering into the construction of this boat will be interesting in connection with the plan, as the vessel is very strongly built. The keel plate and sheer strake are $\frac{3}{8}$ inch thick and the balance of the plating $\frac{5}{16}$ inch thick, the butts being lapped throughout. The deck house and casing is $\frac{1}{8}$ inch with Z iron on top for a finish. Other dimensions for hull material are: Frame angles, $3 \times 2\frac{1}{2} \times \frac{5}{16}$ inches; reverse frames, $2 \times 2 \times \frac{5}{16}$; floor plates, 18 inches $\times \frac{5}{16}$ inch thick; beams, $4 \times 2 \times \frac{5}{16}$ inches; keelson angles, $2\frac{1}{2} \times 2\frac{1}{2} \times \frac{5}{16}$; bulkheads, $\frac{3}{16}$ inch plating; deck, $\frac{3}{16}$ inch thick; ash flat, $\frac{1}{4}$ inch thick; shoveling flat, $\frac{3}{16}$ inch thick; bunkers, $\frac{3}{2}$ inch thick, stiffened with angles, $2 \times 2 \times \frac{1}{4}$ inch, two feet apart; keel bars, $5 \times 1\frac{1}{4}$ inches; stern post, $5 \times 1\frac{1}{4}$ inches; stem, $5 \times 1\frac{1}{4}$ inches. The coal bunkers on either side extend for 23 feet of the vessel's length giving a coal space of 2,000 cubic feet, or capacity for forty-five to fifty tons.

The other two tugs, now well under way, are numbered 55 and 56. No. 55 is $70 \times 16 \times 9$ feet and No. 56 is $55 \times 14 \times 8$ feet. Joseph R. Oldham represents the owners in the building of all three of the boats.

First Cargo of Oil From the Lakes to Liverpool.

In the REVIEW of the 5th inst. attention was directed to a request from a subscriber for information regarding the first cargo of oil shipped

from Lake Erie across the Atlantic without breaking bulk. Capt. Charles Gale, who was a shipmaster for forty-three years and is now seventy-seven years of age, writes us very fully on the subject from his home in Sombra, Ont. He says: "In November, 1865, I was master of the barkentine Thermutis. I loaded for Messrs. Hussy & McBride of Cleveland, O., 3,200 barrels of oil for Liverpool, Eng. I also took 35,000 staves, 25,000 feet of walnut lumber, 600 oars, fifty barrels of apples and 100 bushels of peas. On Nov. 20 at 5 a. m. I left Quebec bound for Liverpool, and I arrived there on Dec. 9 at 6 a. m. Mr. McBride sold his oil for 60 cents a gallon. The cargo came out all right, only one of the barrels showing a slight leak. I made two voyages to Liverpool between April and December and one grain trip on the lakes. The first trip was with copper ore from the Bruce mines, and on the return I had 600 tons of general cargo for Toronto and Hamilton, Ont. It was very stormy the entire passage. Six ships left Quebec nine days before me but had not arrived when I got there. I am sure this was the first cargo of oil from the lakes."

Capt. Gale encloses in his letter a newspaper clipping, which is colored with age, referring to his arrival in the Mersey.

Hydrographic Work on the Lakes.

It is evident that the naval officers connected with the hydrographic service are determined upon a careful but earnest effort to secure control of the hydrographic and surveying work on the lakes now being conducted by the army engineer corps. Chairman Sayer of the appropriation committee of the house has promised an appropriation of \$1,500 for a branch hydrographic office in Cleveland, and, this, with the branch office already in operation in Chicago, will be the means of giving the executive officers of the service in Washington a pretty fair insight into lake shipping. In a personal letter to the REVIEW, one of the officers of the service refers at some length to the communication from Lieut. Charles S. Riche, corps of engineers, United States army, printed in our issue of April 5, but refuses to have the matter appear as a communication, on the claim that the hydrographic office is not as yet well known on the lakes, and on this account would be at a disadvantage in a controversy. The following extract from the letter can not therefore be taken as a formal answer to Lieut. Riche's communication, but it will serve to show the claims that are made for the work of the hydrographic office:

"The hydrographic office at the present time is in no position to enter into a public controversy in this matter, because the people of the great lakes do not know us and have no basis whatever, from their own experience, of judging us from our work. It is hoped by this office to change this in good time. The army officer did not talk to the real point at all. It is a poor surveyor who, with an ordinary education and the best instruments, can not make a hydrographic survey. The army has done good work on the lakes, but, according to navy standards, has not done it in good form for navigators. To us, some of their publications would be absurd if held up as models for nautical use. The hydrographic office desires to connect itself with nautical practice on the great lakes and benefit it if possible, and to derive benefit from it which may be spread forth for the general good. The army simply can not exert any great amount of beneficial influence on nautical practice.

"The hydrographic office has made itself known all over the world and has achieved a greater reputation on our seaboard and abroad than any other similar institution in the world. Foreigners do more to help us than they do for their own home offices. The same co-operative interest can be aroused on the lakes. At present it is found that the newspapers in the lake regions go to army officers for nautical information. They did this in Chicago in the case of the stranding of the Kearsarge, forgetting that there was a branch hydrographic office there which could have given them every bit of information that was in the possession of the navy department.

"The work of this office does not include simply surveying and the publication of charts, but involves a great scheme which takes cognizance of surveying, drafting, engraving and publishing, together with the reception and extension of nautical information through the medium of periodical publications relating to nautical matters. Our scheme involves the correction of nautical charts to the latest dates, the issue of sailing directions, pilot charts, notification of the correction and cancellation of charts, and advice as to new or approved nautical practice, the use of nautical instruments, etc., etc. Obviously, army engineers could hardly be considered in this line of business at all. The army having had in charge the survey (per se), on the great lakes, naturally does not desire to have us go into it with a commanding influence. Of course the army knows perfectly well that we will overlap their field on every side, but human nature is more or less the same all the world over."

In an international steam yacht race on the Mediterranean recently, the best speed was but a little better than 15 knots, over a 75-mile course from Monte Carlo to Genoa. The winning yacht was the Fauvette, 420 tons, owned by M. E. A. Perignon of Paris. Gordon Bennett's Namouna, 740 tons, was second.

Illustrated Patent Record.

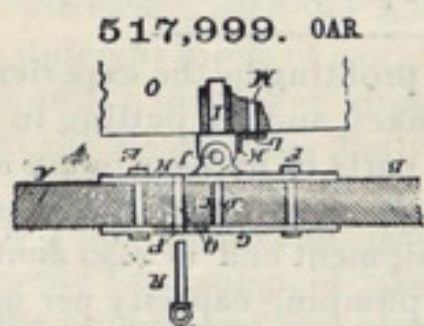
SELECTED ABSTRACTS OF SPECIFICATIONS OF A MARINE NATURE—FROM
LATEST PATENT OFFICE REPORTS.

517,999. OAR. Arthur H. Burns, Pen Yan, N. Y. Filed Oct. 21, 1893. Serial No. 488,787. (No model.)

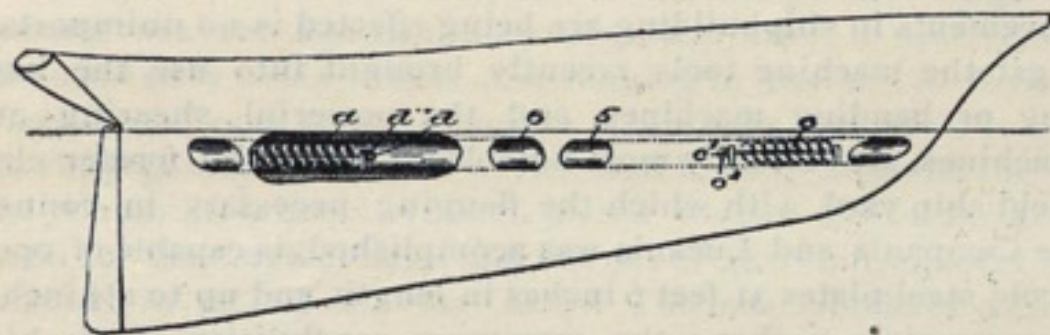
Claim.—In a bow facing oar apparatus, the combination of a boat having a row lock journal and a pin-hole alongside, a swiveling row-lock pintle provided with a horizontally extending bracket secured to the side of the pintle having a pin-hole therein adapted to register with the pin-hole in the boat, a swiveling row-lock frame pivoted to said pintle, inner and outer oar portions pivoted in said frame, mechanism connecting said portions for producing a corresponding reverse movement upon their pivots, registering pin-holes in the oar and frame, and a pin adapted to be transferred from the last named pin-holes to those upon the boat and pintle.

517,859. HOISTING AND CONVEYING APPARATUS. Seth M. Hewett, Minneapolis, Minn. Filed Feb. 18, 1893. Serial No. 462 883. (No model.)

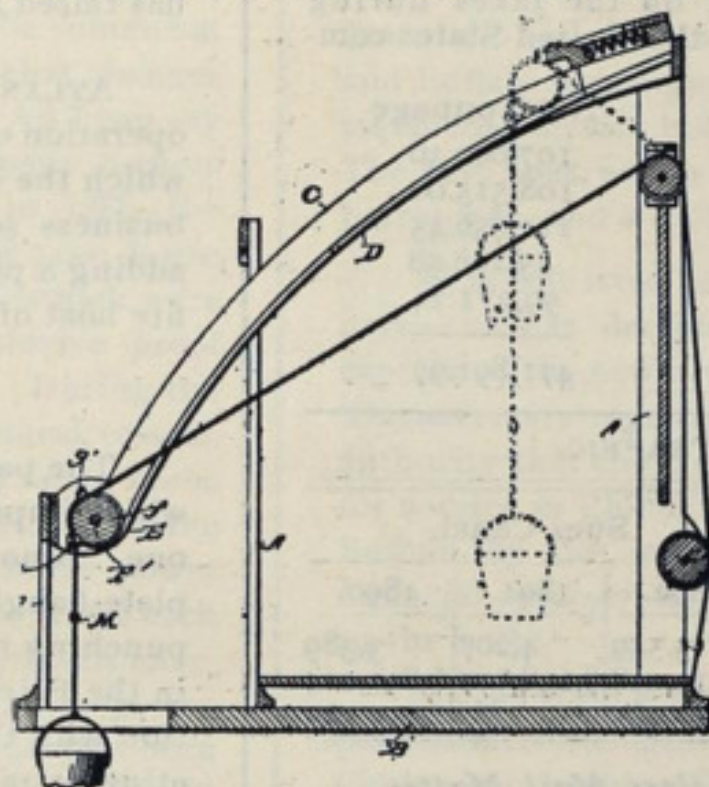
Claim.—In a hoisting apparatus, the combination with a fixed inclined track, a fixed pulley, drum and rope, of a carriage, traveling on the tracks, having wheels at each side, a central pulley over which the rope passes and a frame journaled on the carriage and having an aperture at the bottom and a bridge at the top for co-operation with the rope.



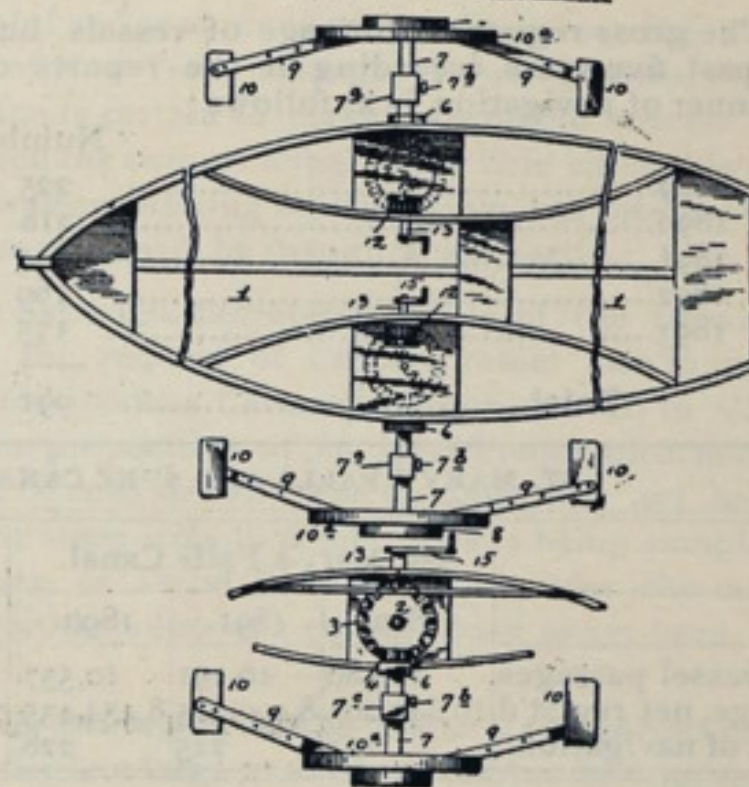
518,028. VESSEL AND PROPELLING MECHANISM THEREFOR.



517,859. HOISTING AND CONVEYING APPARATUS.



518,072. BOAT-PROPELLER.



517,859. VESSEL AND PROPELLING MECHANISM THEREFOR. Rufus Folsom, Chelsea, assignor of one-half to George A. Folsom, Boston, Mass. Filed Dec. 29, 1892. Serial No. 456,623. (No model.)

Claim.—A vessel provided with straight or substantially straight bow and stern tubes: the bow tubes entering the vessel at the bow and extending divergently rearwardly toward and terminating at the sides thereof, and the stern tubes entering the vessel at the sides and extending convergently rearwardly toward and terminating at the stern thereof, whereby a direct flow of water may be had through said tubes to reduce the frictional resistance of the vessel when moving through the water.

518,072. BOAT PROPELLER. Frank P. McElfresh, Kinballton, Iowa. Filed July 17, 1893. Serial No. 480,726. (No model.)

Claim.—The combination with a boat of the horizontal crown-wheels, the transverse shafts having a pinion engaging with said crown-wheels, the shafts pivoted to said transverse shafts, the hubs carried thereby, the inwardly inclined adjustable arms secured to said hubs and provided with paddles, the pinions meshing with said crown-wheels and their shafts and cranks.

The St. Louis and St. Paul.

Special Correspondence to the MARINE REVIEW.

PHILADELPHIA, Pa., April 19.—Although officers of the William Cramp and Sons Ship and Engine Building Company, builders of the American liners St. Louis and St. Paul, have discouraged any claims of great speed for these new boats, it is evident, as work upon them progresses, that they are expected to be the fastest big vessels in the world. The builders are sparing neither pains nor money to attain this end, and it is certain anyhow that Americans will have no cause to be ashamed of the ships that are to carry the stars and stripes across the north Atlantic.

Readers of the REVIEW are acquainted with the principal dimensions of the ships, but in connection with some reference here to hull construction, it may be noted that they are twin-screw steamers of about the same dimensions as the Paris and New York—563 feet on the L. W. L., 63 feet beam and 42 feet moulded depth. They will each have two quadruple expansion engines and ten boilers,—six double-ended and four single—the engines to develop with forced draft about 11,000 horse power each. The passenger accommodations will be suited to about 320 saloon passengers, 250 second cabin and 900 third.

And now as regards the modeling of these ships, it may be said that great care has been taken to make them of a distinctively American type. The straight stem, full stern, graceful lines, pilot house well forward and well up, together with their taut and ship-shape appearance will denote their nationality wherever they may go. Great care has been taken to obtain sufficient longitudinal strength in the boats. The shell plating is riveted on the lap-butt system, and this style of fastening has also been introduced wherever it was found advantageous to do so. All the fastest liners now running have shown weakness in this respect and have been fitted with extra stiffening from time to time. The Paris and New York, which have their shells butt-straped, have shown this weakness more than the Majestic or Teutonic, which are built on the lap-butt system, and which, moreover, are longer than the former vessels and not so deep. The Lucania and Campania are also lap-butt, and though very flexible in a seaway hold well together, showing that this system is the best possible. The frames of the St. Louis and St. Paul are bent out and around the shaft right aft to the stern casting, thus giving extra buoyancy and steadiness at a part of the vessel where it is much needed. This is a much better system than that adopted for the New York and Paris, which have only a few frames bent out and the remaining support for the shafting riveted to the shell. In the former case this swell for the shafting forms part of the hull; in the latter case it is only stuck on.

A new feature about these boats is that the main deck and the deck

below it have no round up, though the sun deck over the main deck has considerable camber. This, as will be seen, gives a better floor for passenger accommodation, and makes walking on these decks much easier to those who are not used to the ways of the sea. Everything is being done that can be done to give these boats sufficient stability without water ballast, and as their dimensions do not differ materially from those of other boats that require this factor, the additional distance between the meta-center and the center of gravity must be obtained by a better distribution of weights. Nothing can be said at this stage as to the time when these boats will be completed, but it must always be remembered that they are the first of their kind built on this side of the Atlantic and that considerable time had to be spent upon alterations, which were made while the work on the ships was going forward.

The method of getting out the frames appears to be a blend of the black-board and mould systems, and is well adapted to the requirements on this side of the Atlantic. The work done by it is of the very best.

Favors Surveys Under the Direction of Engineers.

H. C. Pearsons, surveyer and engineer of Ferrysburg, Mich., is heartily in favor of continuing the work of re-surveys on the lakes under the direction of the army engineer officers. In a communication treating of other questions in close relation to this subject, he says:

"The remarks, in your issue of the 5th inst. of Lieutenant Charles S. Riche, U.S.A., of Sault Ste. Marie, concerning the resurvey and charting of the great lakes, are most pertinent and opportune. There are no people so well qualified to do this with economy, as those who have for years been in charge of the public works on the lakes, and who, besides having large files of survey notes on hand, know what is wanted and where it is wanted; who could go to a place of work and dispose of it, before strangers could learn what is wanted, or where it was wanted. With regard to the kind or part of the work to be done, there is no question as to the accuracy or the completeness of the geographical part. But with regard to the depth of water, which has changed, and with the great addition to the draft of vessels that has been made since the surveys for our present charts were made; a revision of the submarine or hydrographic part, in many places, has become imperative, and no people can do this work so well as those who have had it in charge since its inception."

MARINE REVIEW.

DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 516 Perry-Payne building, Cleveland, O.
Chicago office, (branch), No. 726 Phoenix building.

SUBSCRIPTION—\$2.00 per year in advance. Single copies 10 cents each. Convenient binders sent, post paid, 75 cents. Advertising rates on application.

The books of the United States treasury department contain the names of 3,761 vessels, of 1,261,067.22 gross tons register in the lake trade. The lakes have more steam vessels of 1,000 to 2,500 tons than the combined ownership of this class of vessels in all other sections of the country. The number of steam vessels of 1,000 to 2,500 tons on the lakes on June 30, 1893, was 318 and their aggregate gross tonnage 525,778.57; in all other parts of the country the number of this class of vessels was, on the same date, 211 and their gross tonnage 314,016.65. The classification of the entire lake fleet on June 30, 1893, was as follows:

| Class. | Number. | Gross Tonnage. |
|----------------------|---------|----------------|
| Steam vessels | 1,731 | 828,702.29 |
| Sailing vessels..... | 1,205 | 317,789.37 |
| Canal boats..... | 743 | 76,843.57 |
| Barges..... | 82 | 37,731.99 |
| Total..... | 3,761 | 1,261,067.22 |

The gross registered tonnage of vessels built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

| | Number. | Net Tonnage. |
|------------|---------|--------------|
| 1889..... | 225 | 107,080.30 |
| 1890..... | 218 | 108,515.00 |
| 1891..... | 204 | 111,856.45 |
| 1892..... | 169 | 45,168.98 |
| 1893..... | 175 | 99,271.24 |
| Total..... | 991 | 471,891.97 |

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC.

| | St. Mary's Falls Canal. | | | Suez Canal. | | |
|----------------------|-------------------------|-----------|-----------|-------------|-----------|-----------|
| | 1892. | 1891. | 1890. | 1892. | 1891. | 1890. |
| No. vessel passages | 12,580 | 10,191 | 10,557 | 3,559 | 4,207 | 3,389 |
| Ton'ge, net regist'd | 10,647,203 | 8,400,685 | 8,454,435 | 7,712,028 | 8,698,777 | 6,890,014 |
| Days of navigation.. | 223 | 225 | 228 | 365 | 365 | 365 |

Entered at Cleveland Post Office as Second-class Mail Matter.

ALTHOUGH little had been said up to the present week about the plans of vessel owners to meet the refusal of the Buffalo elevator managers to reduce the charge made for steam shovels in unloading grain cargoes, the vessel owners have not gone into the struggle without plans well laid. At a meeting in Cleveland some time ago, a fund was made up by a pro rata assessment upon all owners whose vessels are engaged in the grain trade, and Brown & Co. of Buffalo were entrusted with the work of preparing for legal action and arranging for reimbursement in the cases of any vessels that may be delayed or suffer loss on account of litigation. The vessel owners are not seeking to reduce the wages of the grain shovelers, who are not too well paid. The objection is to the excessive revenue obtained by the elevators from the steam shovels, which amounted last year to many thousands of dollars. A law of New York state provides that the charge to vessels for trimming or moving the grain to the leg of the elevator shall be only the actual cost of such work, and in view of this law the representatives of the vessel owners served printed protests on the boss shovelers and elevator managers as soon as grain laden vessels began arriving in Buffalo this spring. The ground on which the protest was made was that all that part of the charges covering the use of the steam shovels was excessive, extortionate and illegal, being contrary to the statutes of the state. The elevator managers evidently understood the disadvantages that confronted them from a legal standpoint, as they retaliated by removing the steam shovels, and thus increasing the cost to vessels for shoveling by hand. As far as the vessels are concerned, however, no better time could be selected for delay in unloading, and there is every reason to expect that the struggle as begun will be carried out by the vessel interests and that the charge for steam shovels will be reduced.

VESSEL owners on the lakes are certainly becoming tired of the complications that are continually arising in the rules of the steamboat inspection service. They have not paid enough attention to the board and its doings, and if they ever do get as far as giving the laws a thorough investigation they will undoubtedly find more cause for complaint than has developed in the questions that have come up of late about lights and signals. This board now directs attention to a law which absolutely prohibits the use of passing signals in thick weather, and yet passing signals will be used just as they have been in the past. The law is in some respects a

good law and has found support in some quarters, but it is the fact that such laws are enacted and sprung upon the vessel interests in the nature of surprises that causes most confusion. Then, too, there are so many inconsistencies in the rules of the board that an utter disregard for its authority is manifest at all times and there are numerous instances where no one connected with the service can be found to give a satisfactory explanation of rules that are held up as the law of the United States government for the navigation of steam vessels.

THERE is certainly nothing impracticable in the scheme of the director of public works in Cleveland to widen and deepen the Cuyahoga river for two or three miles above the point at which navigation by deep laden vessels is now stopped on account of the shallow and crooked condition of the channel. The cost of the improvement would be very light as compared with the great expense of building an outer harbor on the lake front, and the disadvantage of waiting for years for appropriations from the general government for the completion of breakwater improvements suitable to such a harbor. The municipal authorities will do well to give careful consideration to the river improvement scheme.

THE recent action of the superintendent of canals, under authority of the New York state legislature, in granting an exclusive fifty-year contract to the Cataract General Electric Company for the transmission of electricity along the banks of the canals of the state, with the right to supply light and power not only for use on the canals, but in all the adjacent territory, has raised a storm of indignant protest in several quarters.

ATLANTIC coast cities are profiting by the experience gained with the operation of fire boats on the lakes, and are putting in pipe lines, through which the boats from different parts of harbors pump a supply of water to business sections some distance away from the water front. Boston is adding a pipe system to its equipment and is also about to build another fire boat of about 6,500 gallons pumping capacity per minute.

Big Machine Tools for Ship Yards.

The part played by modern machine tools in the several directions in which improvements in shipbuilding are being effected is no unimportant one. Amongst the machine tools recently brought into use, the huge plate-flanging or bending machines, and the powerful shearing and punching machines, are certainly most notable. One of the former class in the Fairfield ship yard, with which the flanging necessary in connection with the Campania and Lucania was accomplished, is capable of operating upon cold steel plates 31 feet 6 inches in length, and up to 1½ inches thick. This represents perhaps the maximum capabilities of machine tools of this class with which ship builders are at present furnished. Similar, but in some cases slightly shorter and less powerful, flanging machines are to be found in nearly all the leading ship yards in the country. The makers of the Fairfield machine—Messrs. Hugh Smith & Co., Possil Works, Glasgow, Scotland—have supplied similar tools to nearly all the larger builders. Many of the large ship yard also have patent hydraulic channel and angle bar shearing machines, specially designed for shearing the ends of heavy angle bars and channel bars of large section, such as have been employed in the frame structure of the latest Cunarders, and which promise more and more to be used as frames for large ships. These machines are designed to cut channel bars from 5 inches up to 15 inches broad, by 6 inches deep, and ¾ inches section, and are also adapted, without necessitating any alteration in the shearing blades, for cutting ends of ordinary angle bars either right or left hand, which is under some circumstances a considerable advantage. Plate bending rollers, also plate edge planing machines, have been subject to development in the way of having to deal with the large plates now common. The heaviest plate rolling machine yet made is to be found in the Fairfield establishment, where it was used constantly in the bending of plates for the Campania and Lucania. This machine is capable of dealing with plates up to 32 feet long by 1½ inches thick. A smaller machine has been supplied from Glasgow to Messrs. Cramp of Philadelphia, but capable of dealing with plates up to 32 feet long by 1¼ inches thick only.—From "Helps and Hindrances to Ship Building," Fairplay, London.

A California exchange describes at considerable length the British ship Somali of Liverpool which arrived at San Francisco recently with a crew of forty-one hands, of which twenty-four were able seamen, and remarks that no device of man's brain has yet reduced in a material sense the physical requirements of the crews of sailing ships. Characteristic figures in the dimensions of the big vessel are: Registered tonnage, 3,336; carrying capacity, 5,500 tons; length on keel, 330 feet; beam, 47.8 feet; depth, 42 feet; draught on load line, 25 feet; height of mainmast from main deck, 185 feet; length of mainyard, 92 feet.

James Gordon Bennett is said to have purchased the America's cup defender Vigilant, with a view to taking her across the Atlantic and trying her speed with the Britannia and other craft in British waters.

Misleading Statistics Regarding Shipping.

The table below, which was originally copied from some foreign publication, has been printed in a number of American trade papers of late. It is said to show the rank of seven leading countries as regards ownership of merchant vessels, both steam and sail, but the figures put down for this country are undoubtedly meant to represent only sea-going vessels, if they represent anything at all, as there are on the lakes alone 3,761 vessels of 1,261,067.22 tons, and the average tonnage of ships on the lakes will compare favorably with the merchant marine of any country or section of country in the world. Following is the table, in which the United States is credited altogether with owning only 3,894 merchant vessels of 1,870,397 tons:

| | Number. | Tons. |
|------------------------|---------|-----------|
| Great Britain..... | 14,971 | 9,461,468 |
| Norway and Sweden..... | 5,637 | 2,009,999 |
| United States | 3,894 | 1,870,397 |
| Germany | 2,165 | 1,469,203 |
| Italy | 2,122 | 739,322 |
| France..... | 1,990 | 738,365 |
| Russia | 8,001 | 509,895 |

Many Ships With Belleville Generators.

EDITORS MARINE REVIEW: I notice in your last issue an article entitled "Another Chapter on the Belleville Boiler," in which you give the boiler a rather hard name. A great many improvements have, of course, been made since they were first placed in the Ortegale. The boilers were first built for land service and afterward used for sea service, and had to be somewhat altered to suit the different kinds of work. No one could tell what changes would be required until a number of voyages had been made. All I can say of the result is that the Messageries Maritimes Steamship Company, owners of the Ortegale, in 1886 built the *Singh* of 2,400 horse power; in 1888, the *Australien*, of 7,000 horse power; in 1889, the *Polynesian*, of 7,000 horse power, and in 1890, the *Tasmanien*, of 7,000 horse power, all of which were fitted with Belleville boilers, and this should, I think, be conclusive proof that the company was well satisfied with boilers of that make. During the same period Mr. Belleville fitted these boilers to forty French naval vessels, ranging in size from launches of 32 horse power to ships of 14,000 horse power. In the Spanish navy they were fitted to nine vessels, and in the Russian navy to six vessels, also ranging in size up to 6,000 horse power from launches of 42 horse power. They were also fitted to one vessel each in the Japanese and Italian navies and to two vessels of the Grecian navy. As you know, orders have been placed for two sets of 25,000 horse power each for the English navy, and one set of 4,000 horse power has just been erected in a ship of same navy. Thirteen merchant vessels of different lines have been fitted with these boilers in the same time. If we judge from the great number of them in use as well as the number now building by Mr. Belleville they must be a success. I know them to be first-class in every way, by having had about seven years' experience with them, the results of which were given in an article published in your journal of March 15, 1894.

JOHN A. CURRIER.

EAST BOSTON, Mass., April 9, 1894.

Seeking Uniformity in Vessel Taxes.

Among other matters brought up at Tuesday's meeting in Cleveland of the finance committee of the Lake Carriers' Association, was the question of taxation of vessel property. The various annoyances caused by municipalities like Detroit, Milwaukee and Cleveland attempting to make vessels pay all kinds of local taxes are well understood by all vessel owners on the lakes, and any plan bringing about uniformity and a settlement of tax matters on a fair basis would be agreeable to them. Of course at a meeting in which routine business was hurriedly disposed of, the subject did not receive the attention which it deserves, but Capt. McDougall, who is understood to have given some thought to taxation matters, was, with Mr. Harvey D. Goulder, appointed a committee to formulate a plan of some kind involving action by the general government, regarding which definite steps might be taken later.

The tonnage of the association is above the 500,000 mark.

Miscellaneous Mention.

Frank Harmon and George McNalley of Toledo have purchased the tug T. M. Moore from T. E. Wilson of Cleveland for \$3,250.

Capt. John Ryan, aged fifty-five years, died at his home in Bay City Saturday. He followed the lakes for a great number of years.

Charles W. Perry of Pierpont, Mich., and Jacob E. Jacobson of Milwaukee have sold the schooner *Challenger* to E. W. Drake of Milwaukee for \$1,300.

A sunken pile driver at the foot of Bates street, Detroit, was raised a few days ago by G. B. Davis with the schooner *Reliable* and some wrecking appliances.

Capt. Alex. McDougall was in Cleveland Tuesday on his way to New York to attend a meeting of the Columbian Whaleback Steamship Com-

pany, the corporation owning the passenger whaleback *Christopher Columbus*. A decision will probably be reached at this meeting regarding the service in which the boat will be engaged during the coming summer.

The new association of vessel owners and shippers at Duluth and Superior is organized simply for the purpose of securing united action on local matters and will co-operate with the Lake Carriers' Association.

Capt. John Shaw completed arrangements in Buffalo Saturday with F. P. Gordon of the Northern Steamship Company to have the steamer *Selwyn Eddy* carry flour from the head of Lake Superior during the present season for the Northern company.

Frank E. Kirby of the Detroit Dry Dock Company has been engaged in his capacity as a naval architect to prepare plans for the steel screw steamer which the Goodrich Transportation Company intends to build to take the place of the *Indiana* next season.

The new offices, drafting rooms, etc., of the Union Dry Dock Company, Buffalo, which were rebuilt on account of fire, are about completed and make comfortable quarters for the office force. The tug building for Buffalo parties is ready to launch at any time now.

F. P. Thrall's new steamer at Green Bay has been launched and named *Normandie*. She is twenty-five feet longer than the *Preston*, but of the same general dimensions otherwise. The *Normandie* is under charter to carry 7,000 tons of copper from Lake Linden to Black Rock and return with cedar.

With the aid of careful and accommodating officers on the steamers *State of Ohio* and *State of New York*, Manager Newman of the Cleveland and Buffalo passenger line is certain to make a complete success of the steamboat service between the two principal Lake Erie cities this season. The first boat, which has been running for some time, has been very well patronized, and a daily service will be inaugurated shortly.

As might have been expected, Secretary Carlisle of the treasury department has declined the request of Chicago vessel men to make the captain of the new revenue steamer *Calumet* harbor master in Chicago. The secretary regards the proposition as an interference with municipal authority that could not be considered. The *Calumet* will not be ready for service in Chicago for some time to come. She is being completed in Buffalo by the bondsmen of David Bell, the ship builder who met with financial reverses, and neither boiler nor engines have as yet been placed in the hull.

Sparks from a steamer belonging to the Delta Transportation Company some time ago set fire to a large quantity of lumber belonging to the Cheboygan Lumber Company, and the latter corporation was given judgment for \$14,500 in one of the Michigan courts against the transportation company. Recently, however, the supreme court of the state reversed the decision, on the claim that the steamboat was governed in its operations by the rules of the United States steamboat inspection service, which do not provide for screens or spark arresters in smoke stacks, and which rules prohibit the use of many devices not provided for.

In the office of Farassey & Maron, Cleveland representatives of leading passenger and freight lines, it is possible to make arrangements now for a trip by water or the shipment of freight to almost any point on the lakes. The anchor and Western Transit lines with six passenger boats giving a tri-weekly service to the upper lakes, Grummonds Mackinac Line, Merchants and Montreal Transportation Company and the Cleveland & Port Stanley line are all represented by this firm. The Merchants and Montreal Transportation Company furnishes a boat once a week for Lake Ontario and St. Lawrence river points.

In General.

The navy appropriation bill, in addition to giving authority for the construction of three torpedo boats, instead of dynamite cruiser No. 2, provides for putting new machinery into the *Chicago* and *Hartford*.

English owners of the Otis Steel Company of Cleveland have been receiving very poor returns from the works of late. A report of the sixth general meeting of the company in a London exchange gives the total production in 1893 as only 65,000 tons of steel. The reduction reported in the value of pig iron, etc. in stock amounted to £24,000.

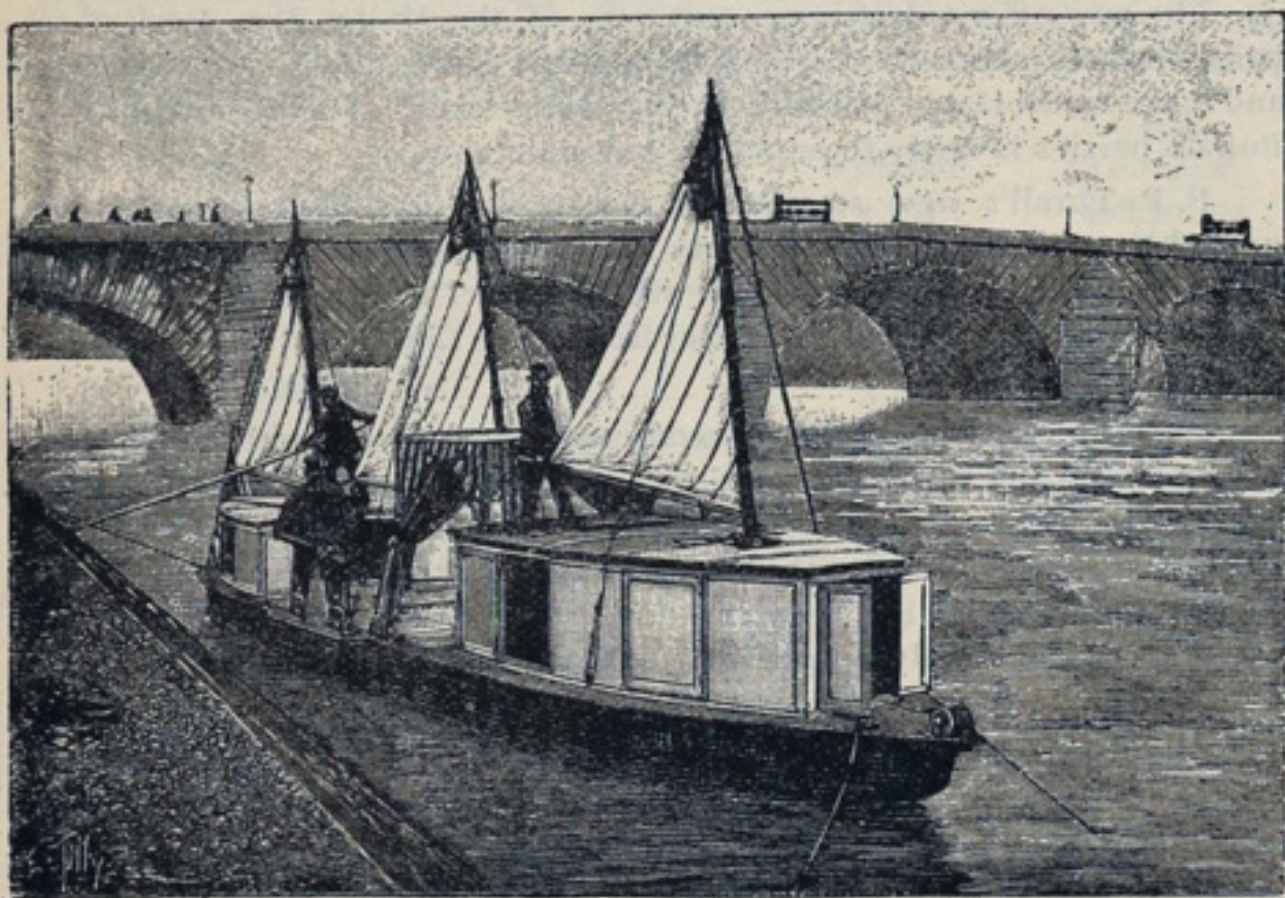
Out of 7,345 shares of stock in the Joseph Dixon Crucible Company represented at the annual meeting held in Jersey City, N. J., on the 16th inst., 7,215 votes were cast for the same board of managers that has conducted the affairs of the company during its years of prosperity. The Dixon Company was founded by Joseph Dixon in 1827 and organized as a stock company in 1868.

SEND 20 CENTS IN STAMPS AND HAVE A COPY OF THE COLOR ETCHING OF THE STEEL STEAMER *GRATWICK* MAILED TO YOUR ADDRESS OR TO THE ADDRESS OF SOME FRIEND WHOM YOU WISH TO PLEASE. MARINE REVIEW, 516 PERRY-PAYNE BUILDING, CLEVELAND, G.

An Aluminum Boat.

The picture of an aluminum boat printed herewith is from the French journal *La Nature*, which describes at some length the plans of two French naval officers who have been entrusted with hydrographic work on the Niger, and who took the boat with them from Bordeaux. The material is aluminum, tough, yet soft enough to undergo forging, pure aluminum being slightly brittle. The boat weighs 4,840 pounds and has a capacity of eleven tons on a maximum draft of but 1.38 feet. Following are the principal dimensions and weights of the various parts: Length, 42 feet; breadth, 9 feet; depth, 2.6 feet; breadth outside of wales, 10.5 feet; light weight, 4,840 pounds; total displacement, 24,640 pounds; corresponding draught, 1.38 feet; mean weight of a section, 82.5 pounds.

There are sixteen half sections, easily transportable, assembled in pairs in the longitudinal direction upon a strong keel of hard steel that



ALUMINUM BOAT, THE JULES DAVOUST.

runs the entire length of the boat. In the transverse direction, each half section is connected with the following by bolts, and tightness is assured by the interposition of a strip of rubber between the flanges. The general aspect is that of a barge slightly depressed in front. This part is occupied by a wooden cabin for the captain and his mate. A second chamber, formed by the hold, is to receive the stores and the goods for trading purposes. At the rear there is a cabin for the crew. The three chambers thus formed are separated by tight bulkheads. The steering wheel is situated behind the captain's cabin. A movable tent arranged at this point is designed to protect the captain and his assistants during the hydrographic observations, and serves likewise to shelter the pilot. The boat was constructed at the works of Mr. Lefebvre of Paris, who makes a specialty of work of this kind.

Canada's Atlantic Greyhounds.

James Huddert, leading promoter of the company which proposes to establish the new line of big steamers between Great Britain and Canada, is the gentleman who two years ago succeeded in establishing a service of mail and passenger steamers between Australia and British Columbia. There is now little doubt of success with this enterprise which has been so long talked of. The services of Mr. R. S. White, who superintended the building of the *Lucania* and *Campania*, has been secured as nautical adviser for the new company which is to have a capital of £2,000,000. It was at first proposed that the steamers, which are to attain a speed of twenty knots, should be from 8,000 to 10,000 tons each, but it is now contemplated to have them 10,500 tons each.

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store at the principal points of accumulation on the lakes on April 14, 1894:

| | Wheat, bu. | Corn, bu. |
|----------------|------------|-----------|
| Chicago..... | 20,253,000 | 5,773,000 |
| Duluth..... | 11,697,000 | 264,000 |
| Milwaukee..... | 929,000 | 3,000 |
| Detroit..... | 2,120,000 | 36,000 |
| Toledo..... | 3,127,000 | 701,000 |
| Buffalo..... | 1,312,000 | 1,377,000 |
| Total | 39,438,000 | 8,154,000 |

At the points named there is a net increase for the week of 622,000 bushels of wheat and 646,000 bushels of corn.

The people along the Nickel Plate road have the advantage of through sleeping car to California points.

Apl 30

Around the Lakes.

Mr. J. H. Killoran has been appointed marine superintendent of the Northern Steamship Company, with offices at No. 60 Main street, Buffalo.

Theodore Planther of Milwaukee has sold the William Rudolph to Henry Bennett of Milwaukee and the Cameron Lumber Company of Torch Lake, Mich., for \$9,000.

Capt. Robert Brown, for many years a familiar figure among lake mariners, is dead at Toronto, aged seventy-two years. During the civil war he commanded the old steamer *Rochester*.

Buffalo is to have another elevator, to be erected by the Marine Elevating Company, of which C. Lee Abell is president. It will adjoin the Marine elevator and will have a capacity of 700,000 bushels.

A dozen vessels have been chartered in Toronto to carry coal from Oswego to Toronto, Hamilton and Oakville. The rate fixed is 32 cents a ton, free in and out. The Kingston rate remains at 25 cents.

The schooner *W. K. Moore* of 618.76 tons gross and 588.10 tons net has been registered in the Port Huron customs district. The official number assigned to her by the United States commissioner of navigation is 81,467.

Captains and engineers of vessels owned by Eddy Bros., Bay City, Mich., are: Steamers—Selwyn Eddy, Capt. H. L. Shaw, Engineer R. Hill; E. C. Pope, Capt. Robert McDowell, Engineer H. Hannett; C. A. Eddy, Capt. W. E. Chateau, Engineer Bissell.

Captains and engineers in the employ of O. W. Blodgett, Bay City, Mich., are: Steamer—C. H. Bradley, Capt. James Bennett, Engineer Adam Haig. Schooners—Mary Woolson, Capt. Wallace Allen; Brightie, Capt. F. H. Lennon; Goshawk, Capt. M. Nagle; B. W. Jenness, Capt. Thomas Turner.

B. B. Inman, Duluth, Minn., has made the following appointments for his vessels: Steamers—E. T. Carrington, Capt. M. C. Miller, Engineer Alex. McLea; Belle P. Crosse, Capt. W. H. Buzzard, Engineer Thomas Buzzard. Schooners—Chicago Board of Trade, Capt. Patrick Gordon; Cl ment, Capt. John B. Gordon.

Our Kingston correspondent says that the new lessees of the London & Port Stanley Railroad are negotiating with a view to opening up a large coal traffic between Cleveland and Canadian ports. With this in view, a strong delegation is now in Ottawa urging the minister of marine to have Port Stanley properly dredged, so as to admit the largest sized steamers.

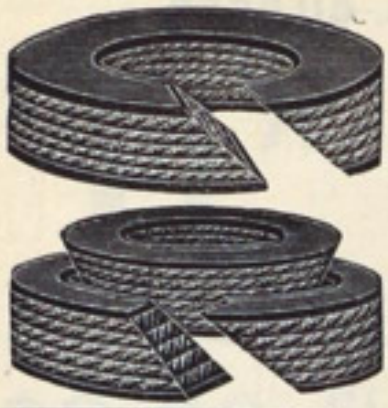
The action of the Saginaw Bay Towing Association, B. Boutelle and P. C. Smith, Bay City, Mich., in equipping their five raft towing tugs with screecher or syren whistles is very commendable. This is required by the proposed new raft towing regulations, but these regulations have not become law, and lake captains will no doubt appreciate this voluntary compliance. The company has seventeen tugs and five of them are regularly engaged in rafting. A raft in care of any of those five will not be run into, if syren or screecher whistles can prevent it. The stacks of this line are white with black tops.

Trade Notes.

Among orders for new ships reported from the Atlantic coast is one from the Maryland Steamboat Company of Baltimore to the Maryland Steel Company of Sparrow's point for a steel side-wheel steamer 175 feet long. The Newport News Ship Building and Dry Dock Company is figuring on a large steel passenger to replace the *City of New York*, which went ashore last winter on the coast of California, and A. Sewell & Co. of Bath, Me., contemplate building another steel sailing vessel.

Thos. Drein & Son of Wilmington, Del., were given preference over competitors in an order for the outfit of the fast *McElroy* steamer of St. Clair, Mich. The Wilmington firm will furnish three of its patent beaded bottomed metallic life boats, three 16-foot life rafts and other life saving appliances to this fast river steamer. O'Grady & Maher of Buffalo have also purchased a metallic boat of the Drein type for a new tug which they are building. This firm also sends us a list of twenty or more orders from coast builders.

What is called Froude's law of increase in the speed of ships assumes as an example, that an increase of one in one hundred, or, as we may say, about four miles a day in the swiftest trans-Atlantic steamers, calls for 2 per cent. of added length, 6 per cent. of displacement, 7 per cent. of horse power and fuel. Compared with the *Paris* and *New York* this increase in the quantities very nearly conforms to Froude's rules in the *Lucania* and *Campania*. It is hard to realize in the progression of speed the value of the "last knot," and, all speculation aside, there is little doubt that the commercial limit of speed at sea has been reached. Size as a factor may go on, but power can not well exceed its present proportions. This element acts in various ways against an increase of speed; by the increased weight and strength required for the framing in the engine-room section, increased weight of machinery, consumption of fuel, the life of vessel and its maintenance.—Industry, San Francisco.



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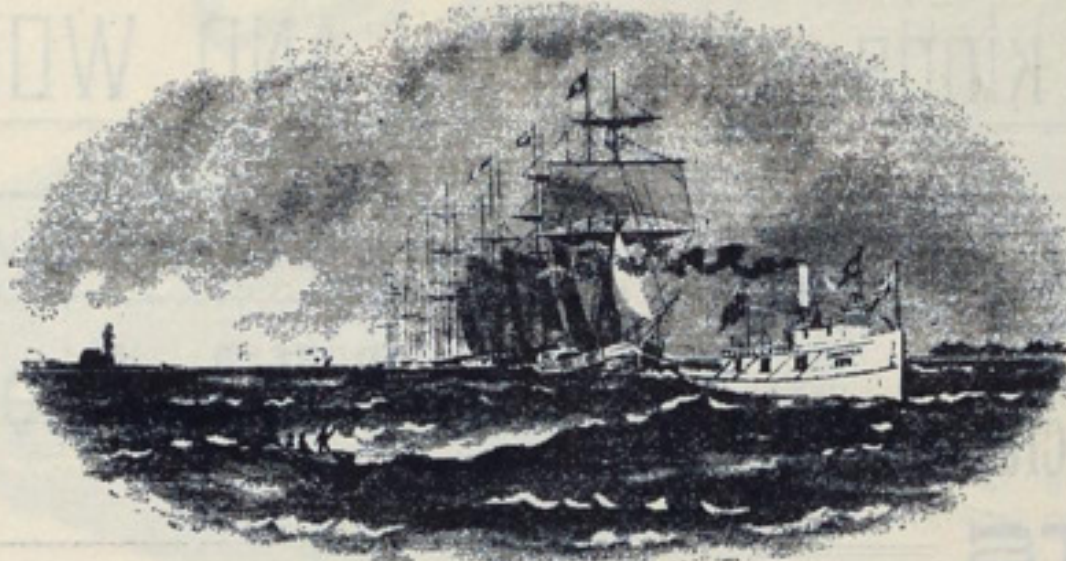
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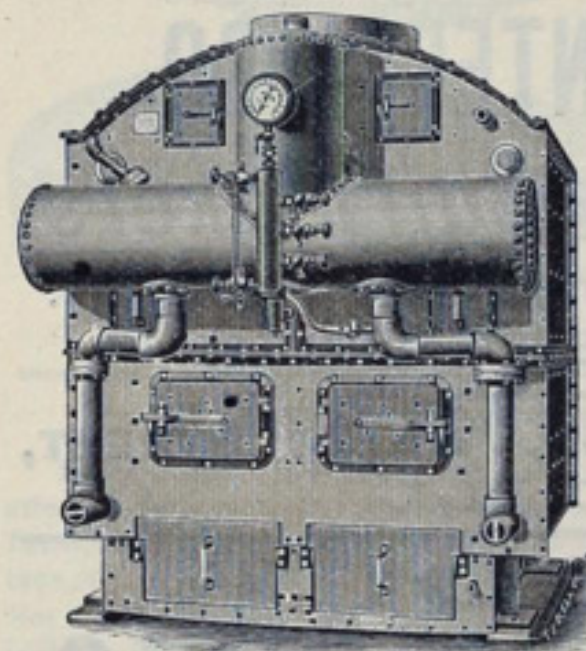
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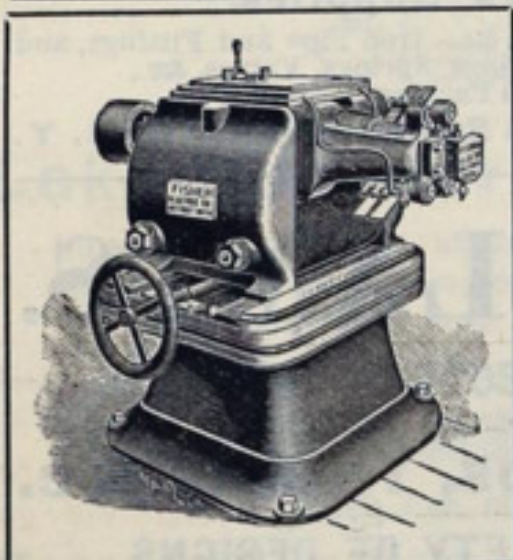
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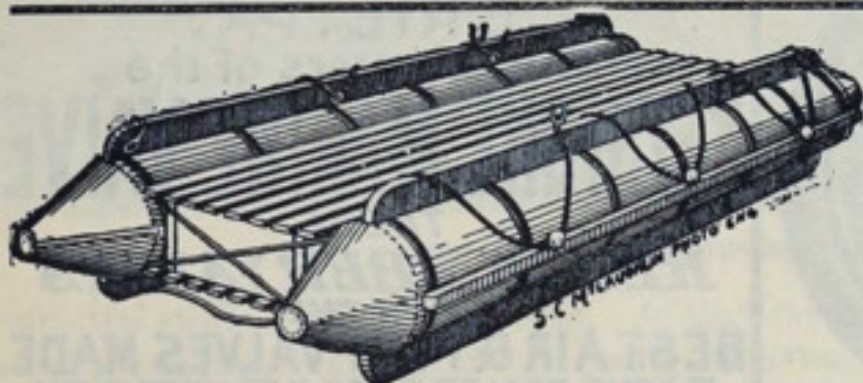
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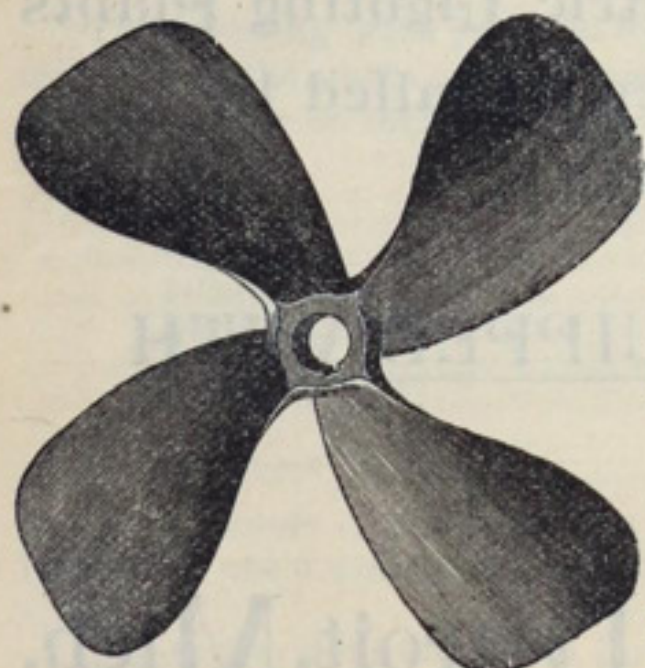
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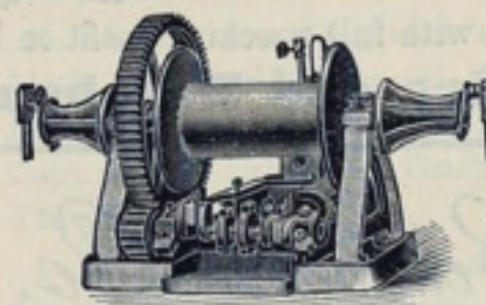
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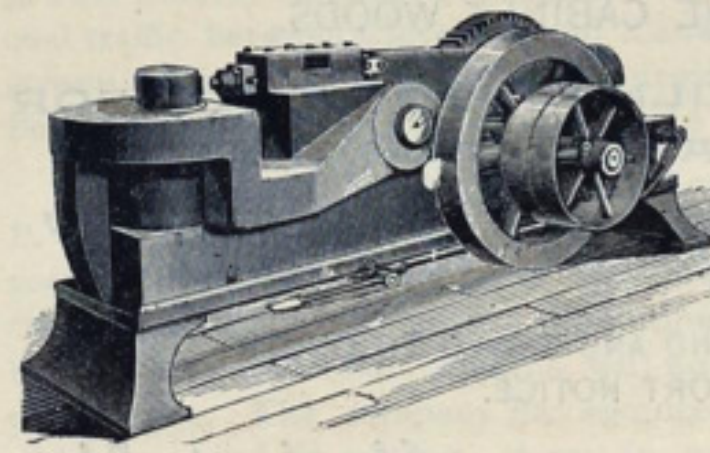
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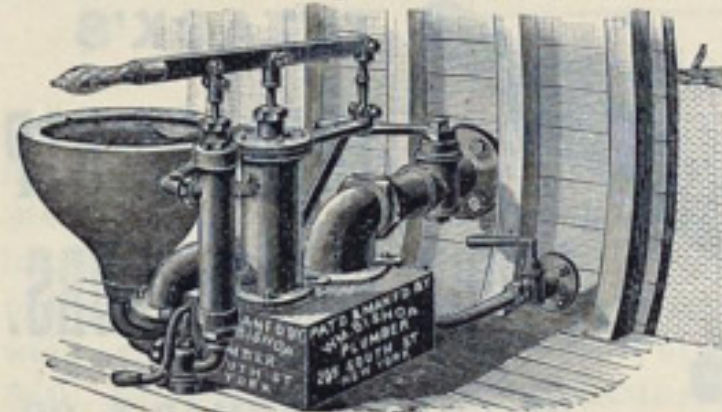
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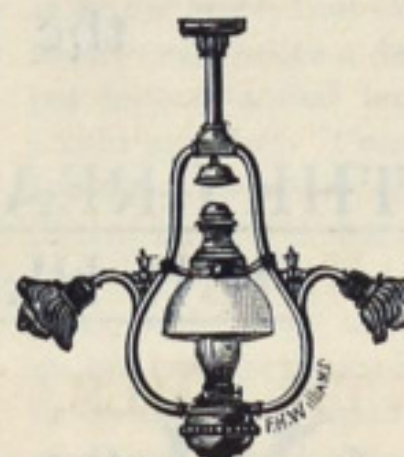
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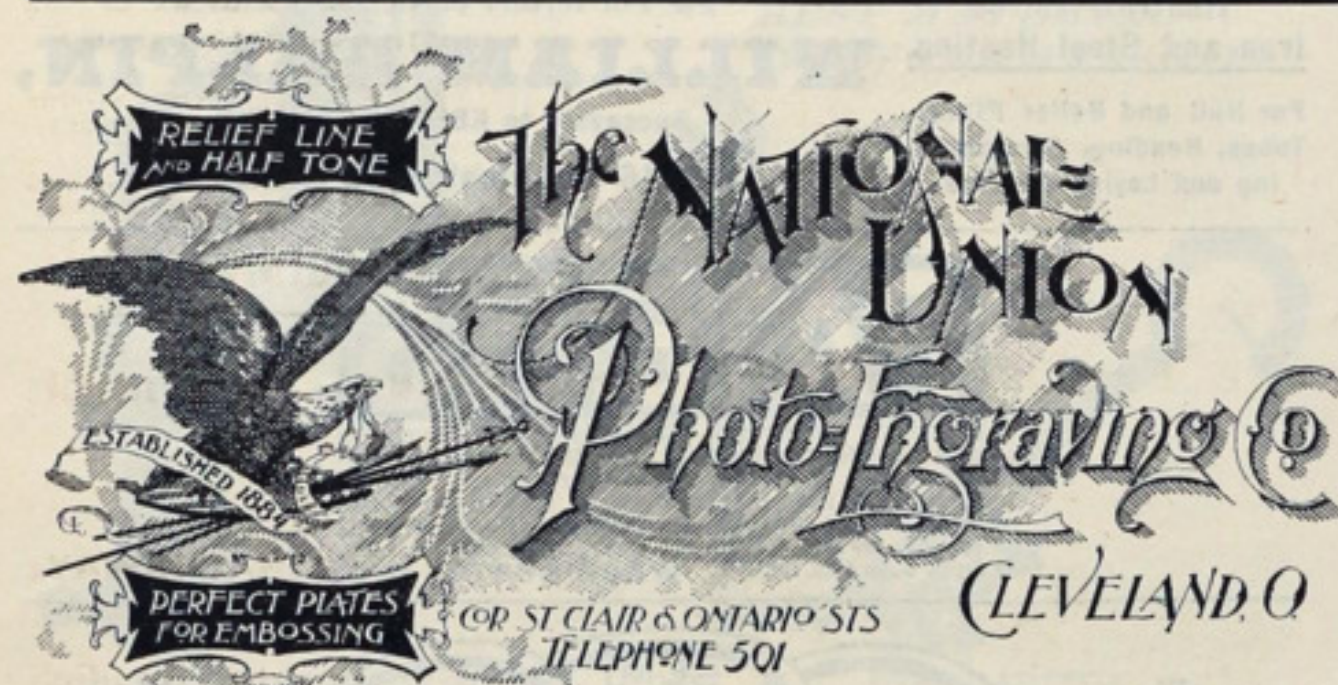


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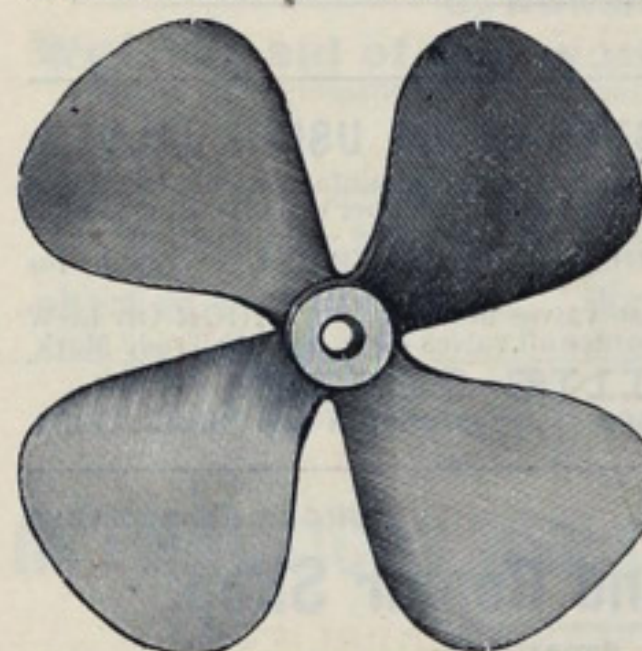
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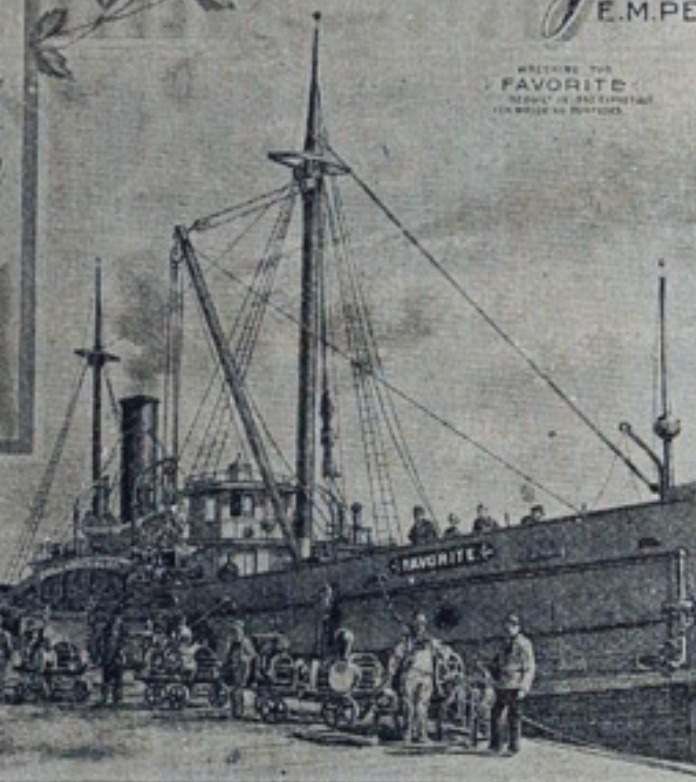
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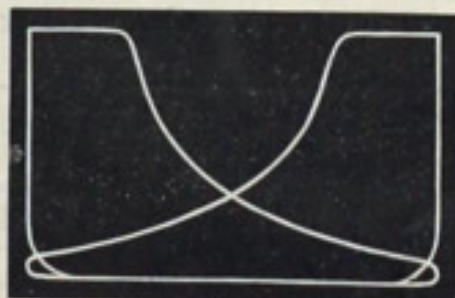
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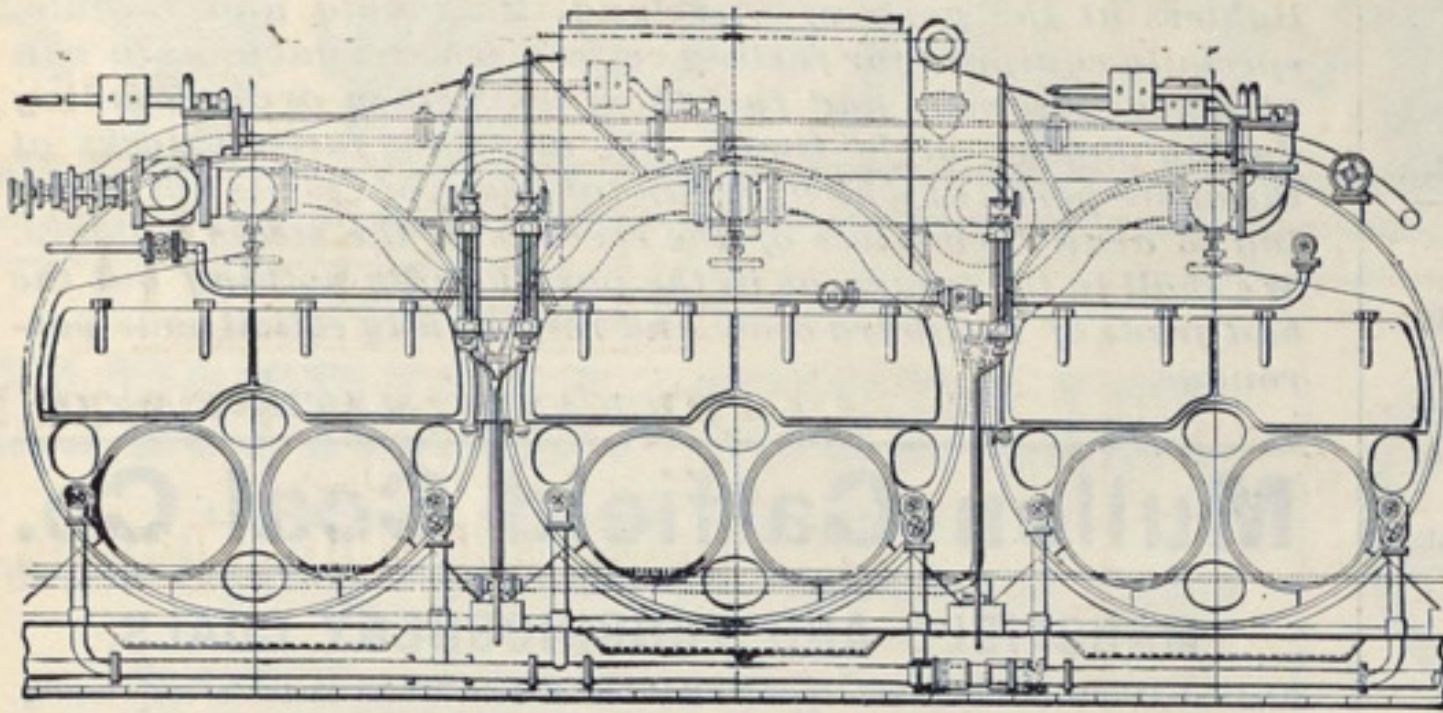
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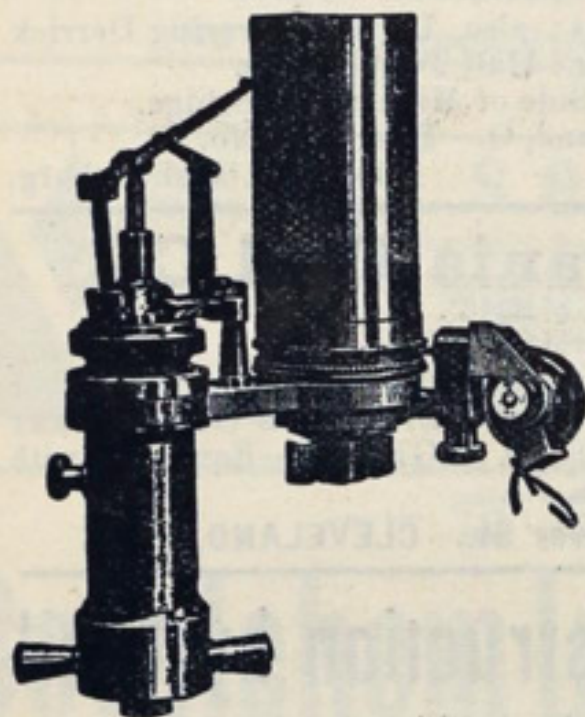
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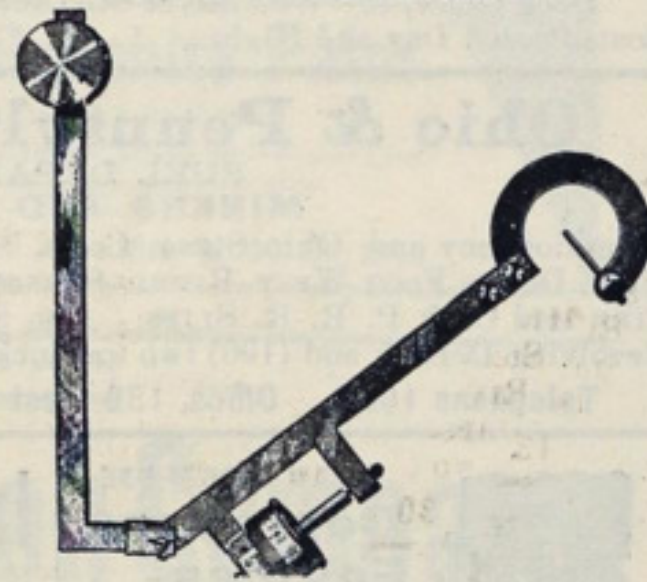
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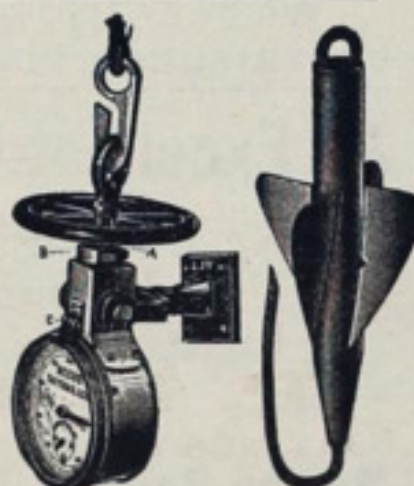
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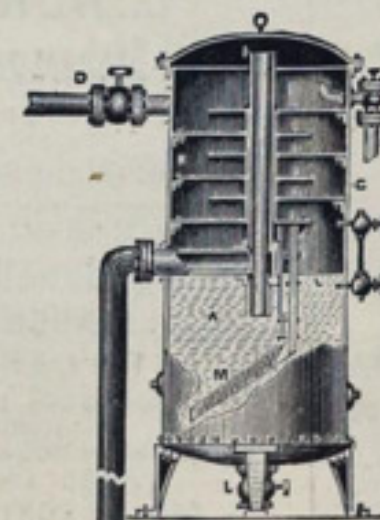
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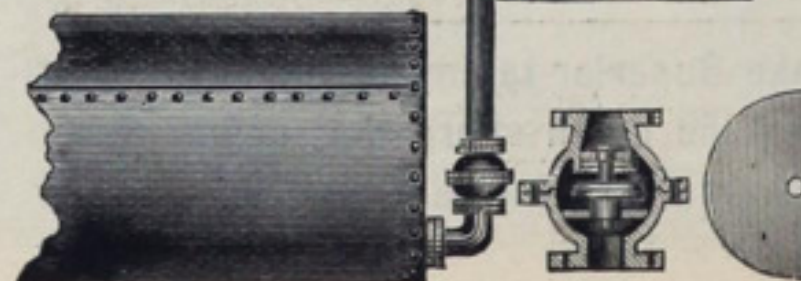
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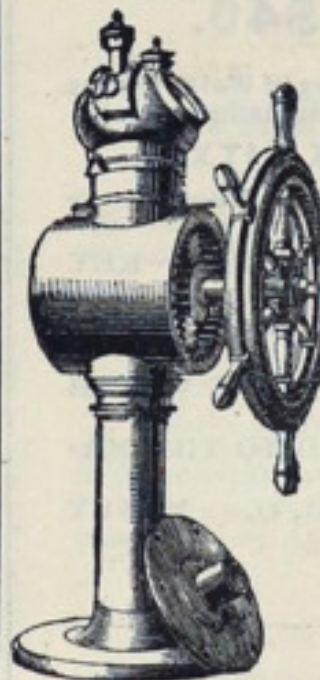
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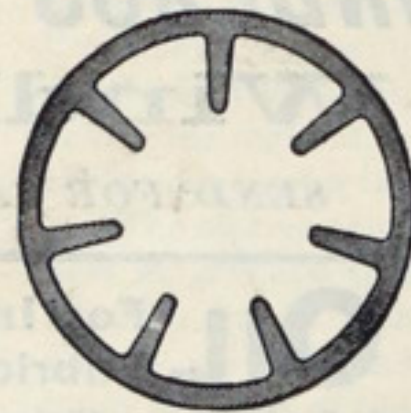
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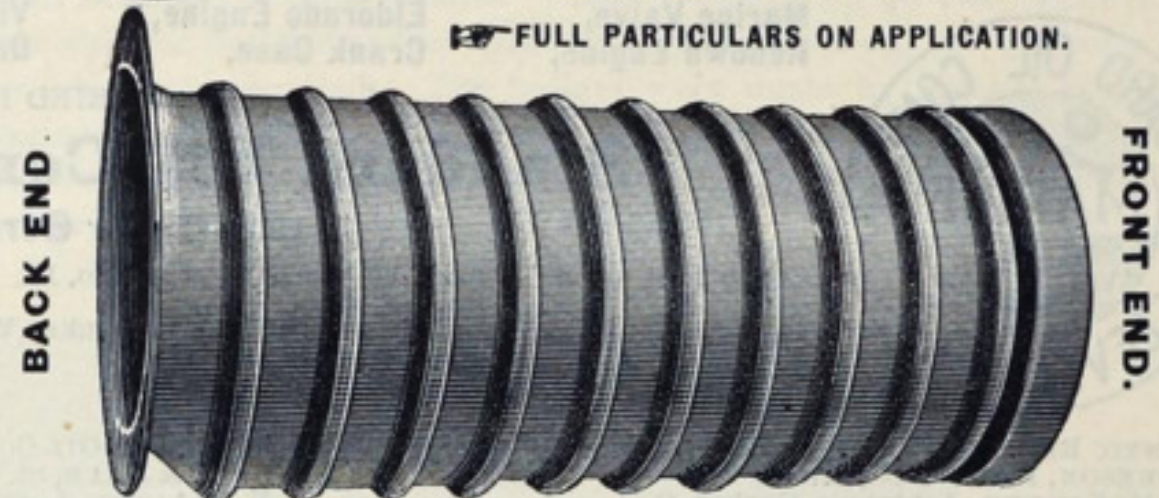
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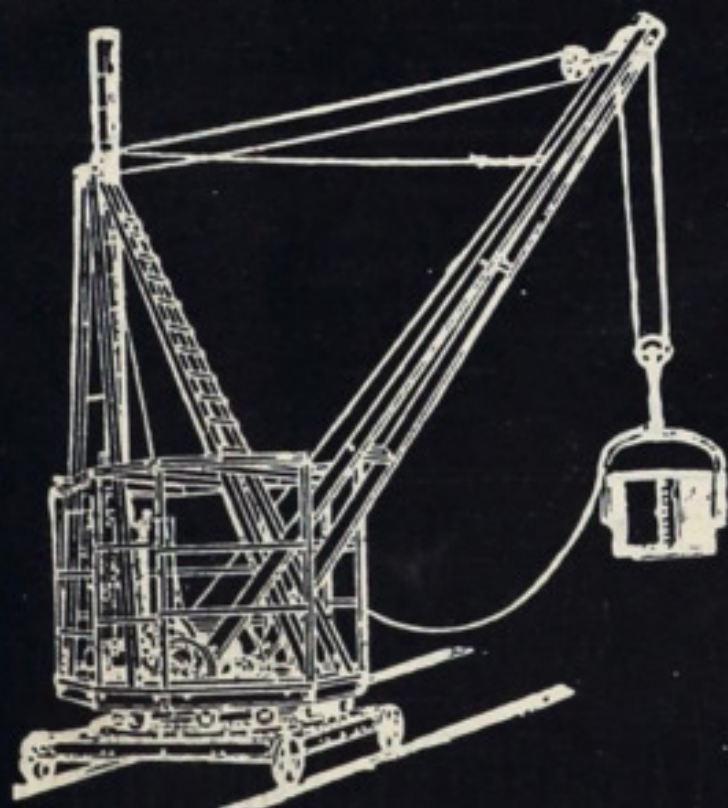
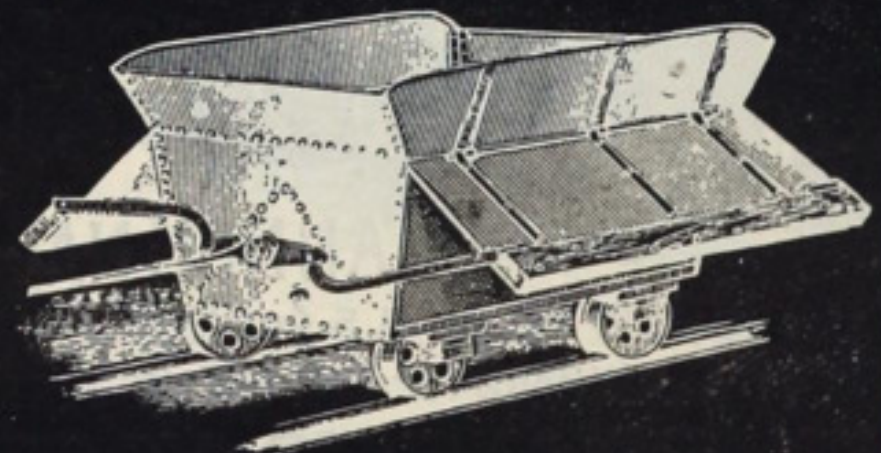
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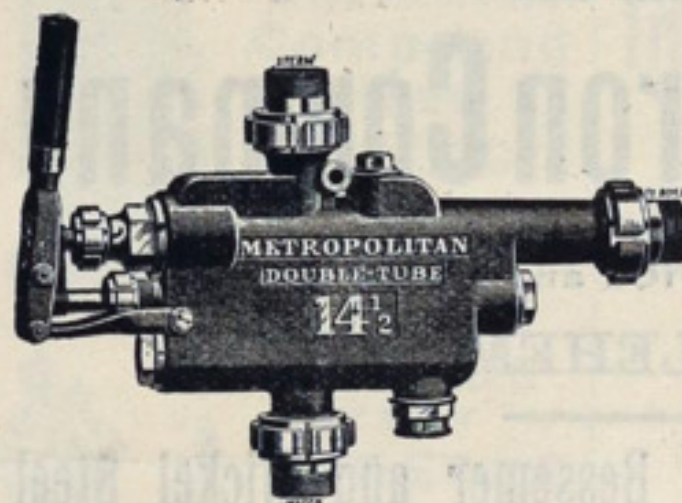
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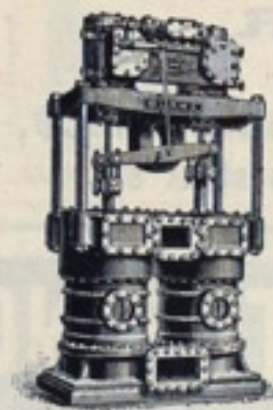
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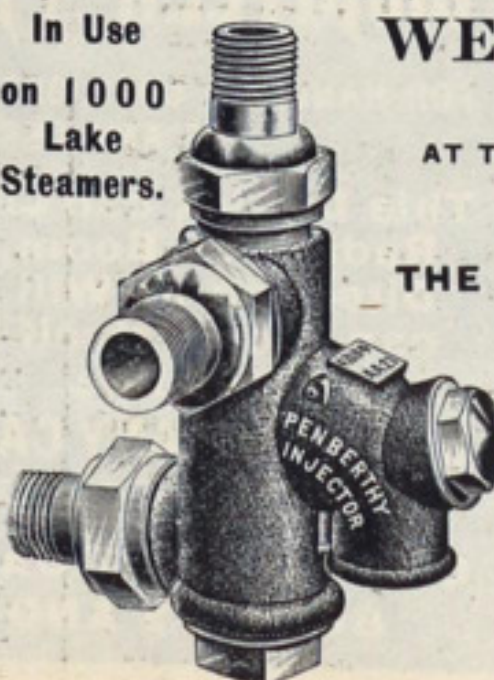
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